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WORLD AIR TRANSPORTATION

NOVEMBER, 1961

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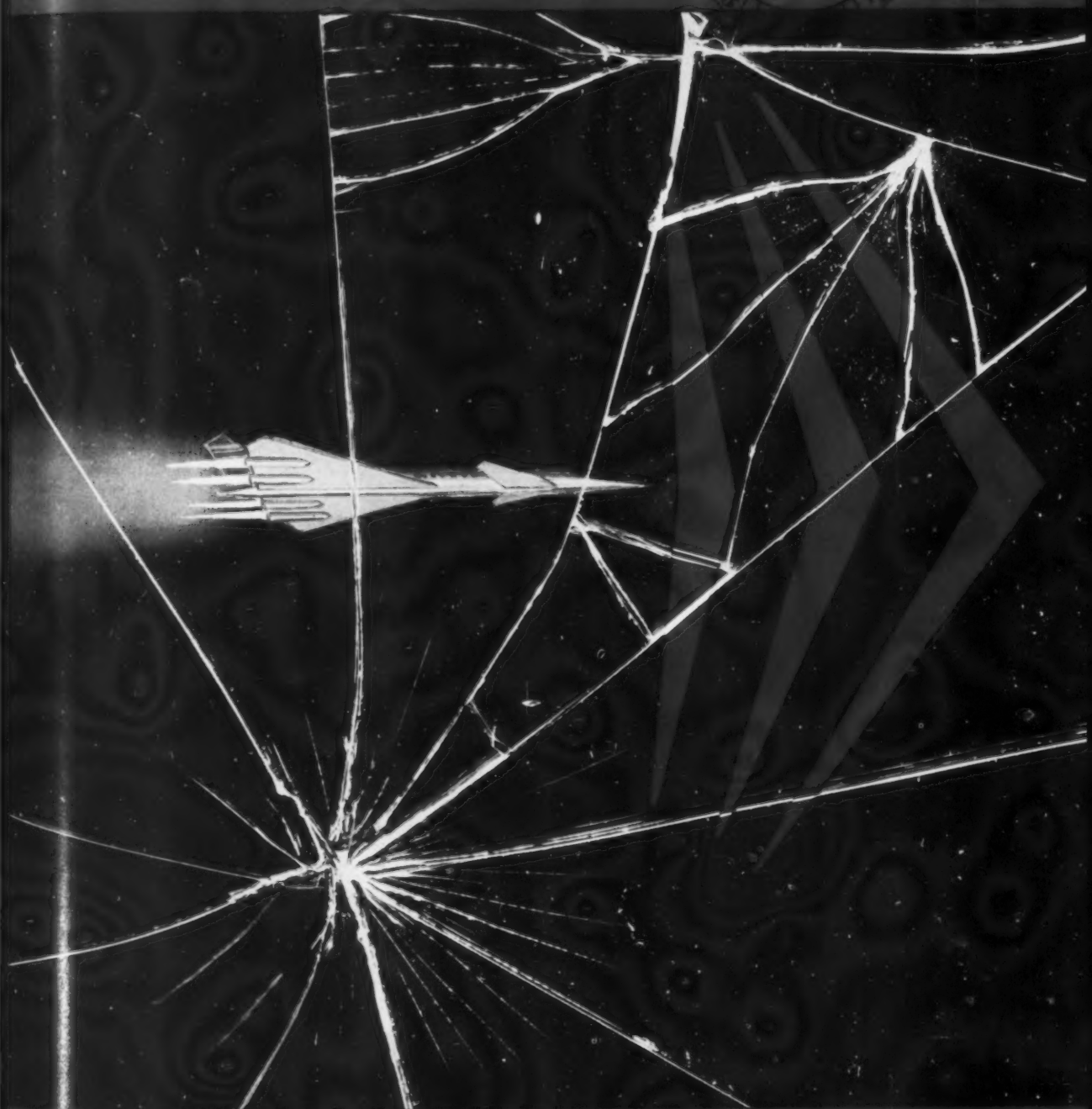


Will Sonic Booms Crush SST?

Who Flies Shorthaul . . . and Why?

Photo Exclusive: Presidents Meet CAB

The Boeing 727: a versatile, short-haul profit-maker

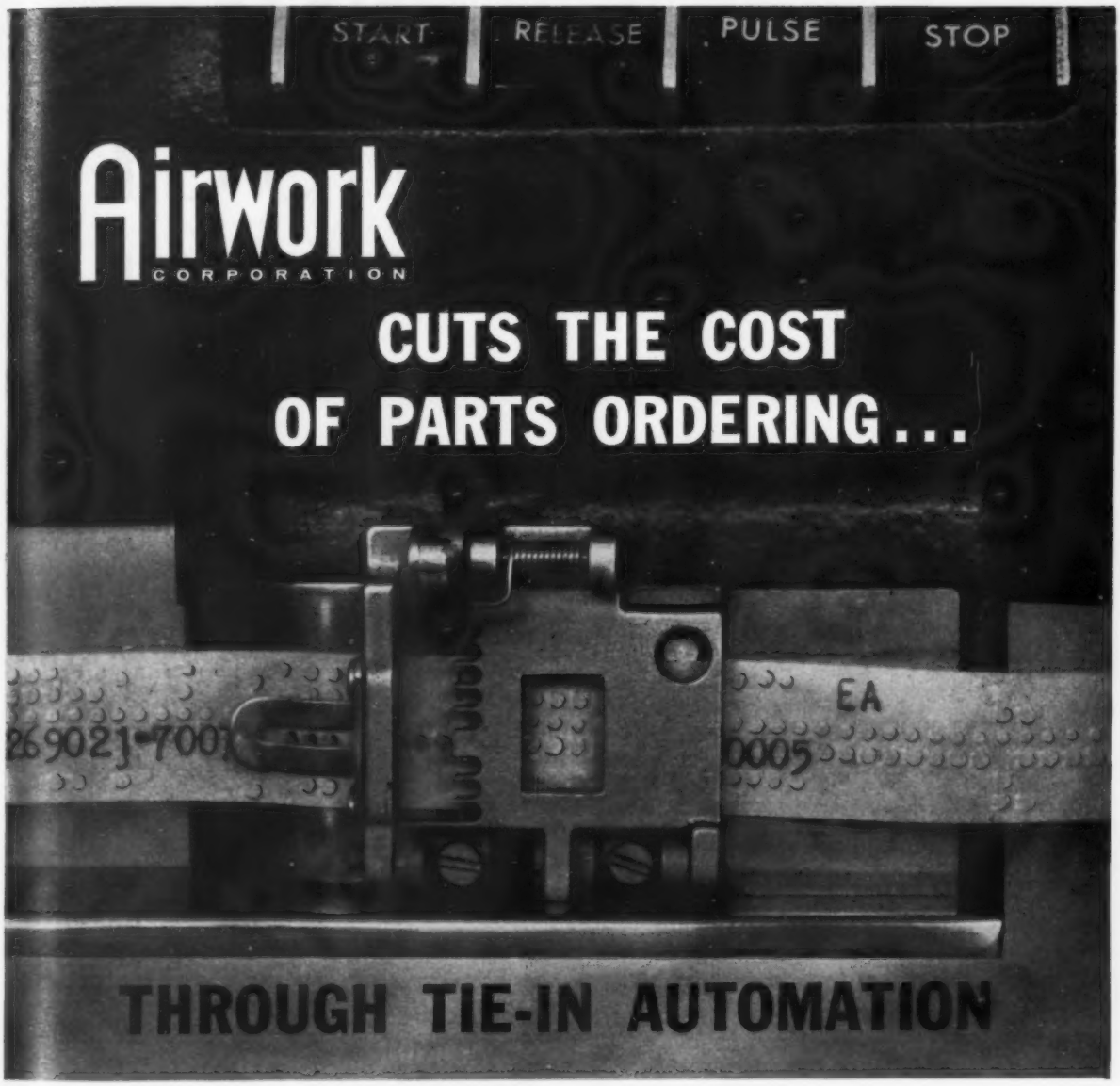
The trim new Boeing 727, now entering production, is a versatile airliner designed to operate *profitably* over route segments ranging from 150 to 1700 miles.

The 727's low operating cost will enable it to produce a profit at short ranges, even with modest load factors. Yet its generous cabin space (70 first-class or 113 tourist passengers) results in seat-mile economy on high-density routes, comparable to that of the largest jetliners.

The 727 will be a rugged jet capable of handling frequent landings and takeoffs. A 7000-gallon fuel capacity, plus high allowable landing weights, will enable the 727 to make frequent stops over a long distance without refueling. This and other features, such as an integral passenger stairway, will minimize service time during stops. The 727's quick takeoff, fast climb and near-600 mph speed will result in block speeds never before attainable in short-haul operations.

Already, 117 Boeing 727s have been ordered by American Airlines, Eastern Air Lines, Lufthansa German Airlines and United Air Lines for delivery beginning late in 1963.

BOEING 727



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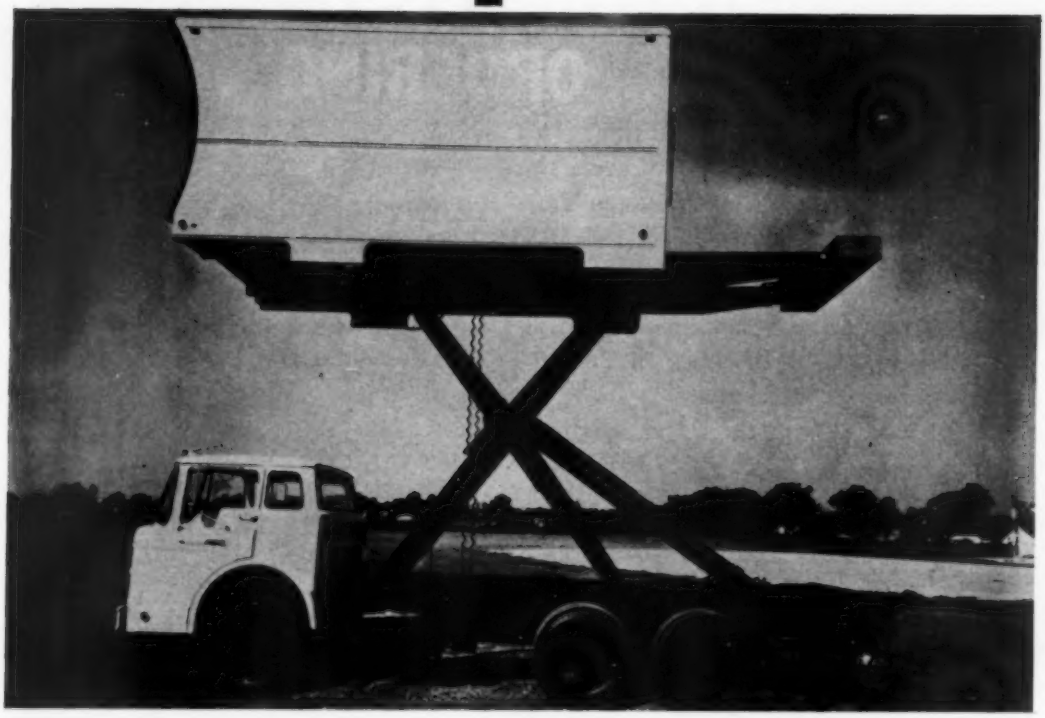

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WORLD AIR TRANSPORTATION

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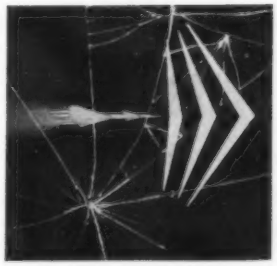

THIS MONTH'S COVER—An artist's conception of the biggest single obstacle in the path of supersonic transport development, the Sonic Boom. Be sure to read the analysis by editors Brad Dunbar (Washington) and Dick Van Osten (west coast) on the current status of "boom research" on page 15.

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WESTERN AIRLINES

The Water Wasn't So Cold After All

IN ALL THE twenty-three-year history of the Civil Aeronautics Board there has been a deplorable absence of rapport between the agency and the airlines it was created to regulate.

Obviously it is not appropriate for such an agency to become too intimate with industry in the sense of socializing and influence. But in an effort to maintain a dignified distance the CAB and its staff have been largely isolated for more than two decades from the main stream of thinking in industry and from the realistic day to day problems of operating public carriers.

At long last the young and vigorous present chairman of the Board, Alan S. Boyd, provided the opportunity for the presidents of the trunk airlines to sit down face to face with four Board members and some of the staff, and discuss freely and openly many of the pressing problems of the day. September 28, 1961, may well go down in air transport history as the day when both industry and the CAB grew in stature to attain a new plateau of maturity.

Two growth factors made this initial meeting possible.

One is industry itself. For the first time the heads of the airlines—all of them—managed to sit in one room and subordinate personalities and other differences to the broader issues common to all. In short, the industry itself has reached a maturity that has become noticeable in the past year or two as economic and other problems deepened and intensified. Age has brought about mellowing, too, while the appearance on the scene lately of two experienced, solid corporation-lawyer executives—Charles Tillinghast of TWA and Malcolm MacIntyre of Eastern—has been a healthy influence in stability.

The second factor is CAB. Not in a good many years has there been a chairman capable of organizing and directing a constructive free-swinging session of the type held Sept. 28. Alan Boyd is the best leader the CAB has had in quite a spell.

From all sides it appears evident that the CAB-industry meeting did a lot of good on both sides of the table. There are many who hope the Board will initiate other such meetings and will take one more very vital step—and that is to visit several maintenance and overhaul bases of the trunk carriers. Has any Board member or staffer ever seen the stock room of a major carrier? Or seen the vast amount of accounting work necessary? Or the vast space occupied by dead files required by CAB orders? Does any CAB member or staffer actually know what goes into operating an airline?

Such direct contacts with industry will do no harm and could do a great deal of good. Regulation cannot be performed in a vacuum or by complete isolation. To Mr. Boyd goes our warmest commendation for taking that first step in rapport. Let there be more.

Frills and Seats

BY ELIMINATING all food and liquor service for coach and tourist passengers, the trunk airlines have doubtless made a constructive move to lower costs and widen the difference between first class and tourist/coach.

But we doubt whether the traveling public is going to be overly-enthusiastic about the airlines' move to do away with reserved first class seats. After all, the privilege of selecting seats in advance can't be a large cost factor and it's one of the relatively few extras which an airline can give to the customers who want and expect consideration for a higher fare.

And may we respectfully submit that in this unfamiliar new order of common understanding, peace and tranquility and togetherness which CAB has fostered of late, the airlines have omitted one feature which would get overwhelming approval from the traveling public? This is to raise the baggage allowance of *first class* customers from 44 to 50 pounds. The public relations benefits would be incalculable.

Double Standard

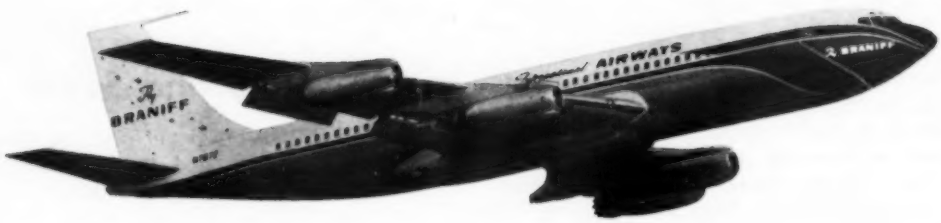
AN AWFUL LOT has been written and orated about the need for supplemental air carriers and an awful lot of pressure has been applied—and strings pulled—to give more legislative and regulatory support to this volatile group.

The time is well overdue, however, for a really objective regulatory look at the whole supplemental and charter question. Eliminate the patriotic fervor that has gone into so much of the debate over the supplementals, and get down to the real nub of the role of these carriers in the economic scheme of things.

This is a real challenge for the able Mr. Boyd as chairman of CAB and we suspect he has been inclined to duck the supplemental problems amidst the pressure of other items of urgent business. The stranding of two charter groups by

Continued on page 9

NEW! MORE NON-STOP JET SERVICE



MORNING MIDDAY EVENING

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Continued from page 7

President Airlines tossed a hot one in Mr. Boyd's lap and he might want to spend more than a passing moment pondering the transfers of the President "certificate" which resulted in three ownerships in something over a year.

It has long been taken as a fact that both CAB and FAA have used a double standard approach for certificated scheduled airlines and the supplementals, in everything ranging from economic and regulatory enforcement to safety. In this latter regard we wonder whether Mr. Halaby has any intention or courage to apply the same scrutiny and enforcement on the supplementals as he does on the scheduled lines.

Sooner or later the shenanigans which permeate a portion of the supplemental group will hit mighty hard on federal authorities who have been more fearful of political pressures than they are of enforcement. But those same political pressures can change mighty fast when the politicos smell the changing winds of public sentiment, whether it be for tragedy or for strandings.

Wayne W. Parrish

LETTERS

Off-the-shelf ATC

To the Editor:

Congratulations on your Technically Speaking item, "Is this progress?", in the September issue of *AIRLIFT*. It displays awareness of a difficult situation.

In referring to scan conversion equipment in your second paragraph, you note, "FAA bought a few off-the-shelf about three years ago, but then the spec-writing bug bit its engineers." As you may know, the off-the-shelf scan conversion units which the FAA purchased came from our company, Intercontinental Electronics Corporation (INTEC). Known as the INTEC TI-440 Radar-to-television Scan Converter, more than 2,000,000 operating hours have been logged in ATC work by this equipment in bright display systems at various FAA air route traffic control centers and towers.

An advanced model INTEC Scan Converter, the TI-441, incorporating improved resolution and flexibility is now also available off-the-shelf.

Your closing sentence reads, "But in the meantime, with usable equipment available off-the-shelf, the safety of ATC has to be content with fifteen year old VG displays the Navy junked after World War II." Although fearful of overtooting our own horn, we feel that available INTEC scan conversion equipment would materially help the ATC situation.

LEONARD GOLDMAN
Vice President, Marketing
Intercontinental Electronics Corporation
Westbury, L.I., New York

Punch Cards

To the Editor:

Your article in the August issue of *AIRLIFT*, "Delta Pioneers Punch Card Purchasing," was very interesting and informative. They have certainly made great strides in automotive material control.

We feel, though, that we should point out that PAA started on a punched card system in 1947. In 1957, we placed the entire Latin American Division inventory, consisting of 90,000 piece parts, on the card 650 computer. Using the computer, we produced all inventory and accounting reports.

In 1960, the entire PAA system inventory, piece parts and components, was placed on the 705 computer in New York. This inventory consists of 120,000 Latin American Division items and 83,000 Overseas Division items.

The detailed information from Latin American Division-Miami is sent to Data Processing, New York, daily, through the use of our land lines and transceivers. Presently, we are processing about 150,000 details per month against our inventory record. Each week, inventory "Exception and Status" reports are produced. At the end of the month, all management and accounting reports are produced from the computer.

A. S. GALBRAITH
Manager of Supply
Pan American World Airways, Inc.
New York International Airport

Design Check List

To the Editor:

Your survey of what airline engineers think about air transport equipment should be one of the most useful guides to equipment designers I have ever seen. The survey should be condensed into a format that could be displayed in design offices. As new engineers replace experienced designers, this would be a valuable check list.

JEROME LEDERER
New Rochelle, New York.

Fares vs. Capacity

To the Editor:

In your September issue there are frequent mentions of the present crisis of the regular airlines due to excess capacity and lack of traffic growth. It surprises me that in such a serious situation no one vigorously considers the possibility that the poor growth of traffic in the last few years has been caused by the successive increases of fares which were initiated in 1958.

A study of the post-war development of traffic in relation to the average ticket prices (corrected for cost of living index) seems to show that the price elasticity of this market is quite high. That is to say an increase in fares will cause a reduction in revenues and vice versa.

The idea that air travelers don't care what it costs because they are business men, should be examined more skeptically. Even if a lot of air travelers are in this category, the lack of growth of the traffic depends on those potential passengers, who are sensitive to prices.

Some years back, when load factors were high, an increase in fares could have been commercially wise. The rate of traffic growth would have been slowed down, which would have been ordered. It is crazy to increase the fares now, when the jets have been delivered.

In short, I assert that there is a relation between the cost of a product and how much you can sell. For regular airline transportation the prices should be reduced until reasonable load factors have been attained. This may not guarantee a profit, but it will at least reduce losses to a minimum.

F. TURNER
Hackefors,
Sweden.

COMING

November

Nov. 1-2—**Radio Technical Commission for Aeronautics,** fall assembly meeting, The Washington Hotel, Wash., D.C.
Nov. 1-3—**Connecticut General Life Insurance Co.,** symposium on the issues and challenges of air transportation, Hartford, Conn.
Nov. 6-17—**Annual Institute on Air Transport Management,** the American University, Wash., D.C.
Nov. 8—**ATA,** public affairs meeting, Kansas City Club, Kansas City, Mo.
Nov. 8-10—**ATA,** airline finance & accounting conference, Muehlebach Hotel, Kansas City.
Nov. 9-10—**American Society for Quality Control,** 11th national conference, Los Angeles.
Nov. 13-16—**Flight Safety Foundation,** 14th annual international air safety seminar, Naples, Italy.
Nov. 14-16—**ATA,** purchasing committee meeting Park Sheraton Hotel, New York.
Nov. 26-Dec. 1—**ASME,** annual winter meeting, Statler Hilton Hotel, New York.
Nov 28-30—**ADMA,** thirty-eighth annual meeting, Jung Hotel, New Orleans.
Nov. 30-Dec. 1—**PGVC,** conference, Hotel Radisson, Minneapolis, Minn.

December

Dec. 5-6—**FAA,** supersonic transport airworthiness conference, Wash., D.C.
Dec. 5-7—**National Aviation Trades Assn.,** annual meeting, Statler Hilton Hotel, Wash., D.C.
Dec. 13—**ATA,** board meeting, ATA board room, Wash., D.C.
Dec. 13-14—**Airlines Electronic Engineering Committee,** general meeting, Wash., D.C.
Dec. 14—**ATA,** membership meeting, Statler Hilton Hotel, Wash., D.C.

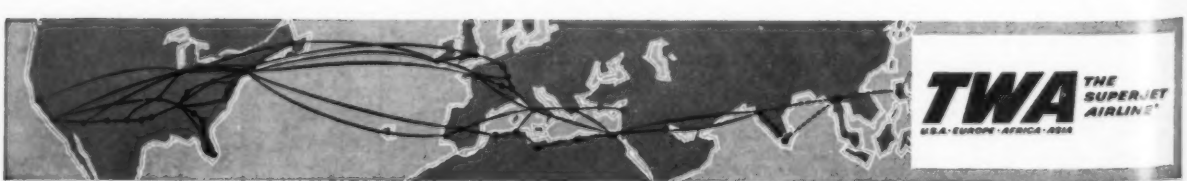
January

Jan. 9-11—**IRE,** 8th national symposium on reliability & quality control, Statler Hilton Hotel, Wash., D.C.
Jan. 9-Feb. 9—**ICAO,** communications division, seventh session, Montreal.
Jan. 16—**Transportation Assn. of America,** annual member and board meeting, New York.
Jan. 17—**Transportation Assn. of America,** transportation institute, New York.
Jan. 21-24—**Helicopter Association of America,** annual meeting, Marriott Motor Hotel, Dallas.
Jan. 22-23—**Assn of Local Transport Airlines,** annual meeting, National Aviation Club, Wash., D.C.
Jan. 22-24—**IAS,** 30th annual meeting, Hotel Astor, New York.
Jan. 22-26—**Pacific Area Travel Assn,** 11th annual conference, Miramar Hotel, Hong Kong.
Jan. 24-26—**ASME,** second symposium on thermo-physical properties, Princeton University, Princeton, N.J.

30 advanced SuperJets joining TWA fleet!

TWA is now expanding its huge jet fleet with 30 of the newest and most advanced jets in the air. In every way, these are SuperJets plus: They have power plus: new high-thrust turbo-fan engines for shorter takeoffs, faster climb. Speed plus: to 625 miles an hour. Range plus: increased fuel reserves. Comfort plus, they fly smoother, faster and higher, far above the weather. Dependability plus: added on-time capability. These 30 additional SuperJets will give TWA the world's finest fleet of 4-engine jets and bring you the world's finest jet service.

Fly TWA SuperJets to your meetings in the U.S. and in leading cities in Europe and Asia



*TWA THE SUPERJET AIRLINE is a service mark owned exclusively by Trans World Airlines, Inc.

AIR TRANSPORT TRENDS

Fares

There's talk of a domestic U.S. fare increase. Some carriers would like to see jet coach fare rise from 75% to 85% of first-class. Eastern president Malcolm MacIntyre voiced this opinion publicly, adding that he'd also adjust piston tariffs (but wouldn't touch first-class jet) to raise revenues 5%. But at least one other big airline isn't ready to state a position yet—there's a sharp division of opinion within the company on fares.

Ground Equipment

U.S. lines are split on proposals to pool ground equipment. One trunkline is convinced that tremendous savings would be possible through joint use of loading stairs, starters, tractors, etc. But another predicts many problems—how to schedule use of equipment when some flights may be late and others early, what happens when two lines need same equipment at same time. This company, however, strongly supports pooling of spare parts.

Equipment

Soviet sales are souring. Reds are having little success in selling commercial transports on world market. Despite highly favorable terms, only two non-communist nations, Ghana and Mali, are operating Soviet-built turbine equipment. The threat of large sales to South America, very real a few years ago, has all but disappeared.

Don't look for production of Viscounts to end before sometime next year. Sales of the British turboprop now total 429.

Handley Page has high hopes for South American sales of Dart Herald. The fact that Duke of Edinburgh will use a BEA Herald on forthcoming Latin American goodwill tour will do the manufacturer's sales campaign no harm.

Traffic

Would "capacity control" work on U.S. domestic routes? One trunk president thinks it might, and believes it could ease problem of excessive competition. On a route served by several carriers, he would seek agreement to limit total capacity to maybe 150% of volume for a certain period. This capacity would be divided as evenly as possible between carriers. A lot of industry executives don't agree with the idea.

Labor

Teamsters are now set for big drive to organize airlines. James R. Hoffa's union has officially established a National Airline Division, promises to provide paid business agents to represent all airline workers who join. Teamsters say that if airlines are going to compete with trucks, rails and other carriers, they must pay wages and provide working conditions now enjoyed by the union's members.

Miscellany

Heard but not seen: American Airlines is going through an "exercise" involving re-engining its Electras . . . Lockheed has been talking to airlines about a Mach 1.4 transport . . . Gross weight of proposed cargo jets is now up to 340,000 lbs. with a P&W JT3D-5-powered version of Douglas DC-8 . . . General Electric is considering a 10,000 lb. thrust fan engine as an alternative powerplant on the Rolls-Royce Spey powered BAC-111.

DEPENDABILITY FOR SALE-- ONLY 42¢

Though an oil filter cover gasket costs only a few pennies, its failure could cause extensive damage to an aircraft engine. That's why this gasket's materials and measurements are as exactingly specified as those for other Pratt & Whitney Aircraft original equipment parts costing hundreds of times more.

But it takes more than adherence to specifications to convince our Materials Control technicians of the gasket's reliability. Before it wins their approval, they check material thickness, smoothness, resiliency, and reinforcement in a continuing program of laboratory tests. They test its performance under varying temperatures and pressures in actual engine operation. Finally, performance is monitored in flight operation by Pratt & Whitney Aircraft's service representatives.

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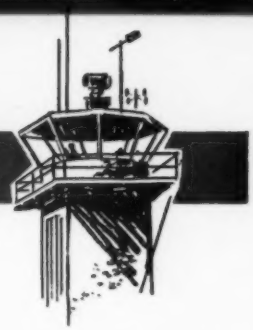

EQUIPMENT

Braniff buys BAC-111—British Aircraft Corp. has broken through with its first solid order for its small twin-jet "One-Eleven" with a contract from Braniff Airways for six and option for six others. (See photo, page 56) It was the first U.S. trunk airline order, broadening the market potential of the aircraft to both trunks and locals. Previously, Ozark has signed a letter of intent for five and Frontier for six.

Caravelle 10A defined—Sud Aviation and TWA have agreed on a firm set of specifications for the Caravelle 10A which the carrier ordered in late September. The new version of the French twin-jet will carry 89 passengers in all-coach seating or 68 in all-first-class. Cruise speed is being increased from Mach 0.77 in earlier Caravelles to 0.81 by addition of a fuselage-to-wing glove to increase sweepback at the wing root plus an anti-shock body at the crux of the empennage.

Landing performance is being enhanced by improved double-slotted flaps which reduce landing distance by 915 feet below that of the Caravelle VI and 492 ft. less than the VIR now used by United Air Lines. Aircraft windows are raised 25 inches to improve passenger visibility. A change in door opening increases underfloor cargo volume by 35 cu. ft.

TWA's Caravelles will be the first powered by GE CJ805-23C fan engines rated at 16,094 lbs. takeoff thrust. Max. takeoff gross weight will be 114,400 lbs. and landing weight 108,900 lbs. Normal cruise speed is 568 mph at 27,500 ft. CAR field length at max. gross takeoff will be 6390 ft. and landing 4752 ft.

MANAGEMENT

NEA talks finances—Northeast Airlines, previously presented with an Eastern-National-Mohawk merger plan, has been listening to proposals under which Hughes Tool Co. would take over the airline.

One plan, forwarded to CAB and then withdrawn, provided that Hughes would acquire control of NEA from Atlas Corp. Hughes would provide NEA with loans of $5 million, of which $1 million would have been made available prior to CAB approval. Negotiations on a new proposal were underway.

BOAC sells BWIA—When British West Indian Airways showed a 1960-61 fiscal year loss of $1.8 million, BOAC decided it was time to pull out. It sold 90% of its wholly-owned subsidiary, which has piled up losses of $9.7 million over the past 13 years, to the Trinidad government. BOAC retains a seat on the board, will continue to lease Britannias to BWIA.

Last year, losses of companies in which BOAC has an interest totaled $5.8 million. The carrier is expected to tell the British government that if it is expected to continue to participate in these companies, it should be given a subsidy for that purpose —or, if it gets no subsidy and losses damage its own balance sheet, the facts must be made plain to Parliament. Otherwise, BOAC may move to drop unprofitable companies.

FARES

Group fare fails—A Pan American proposal for reduced fares for groups of 25 or more on the North Atlantic failed to get the required unanimous agreement in an IATA mail vote. Reason: the feeling of some carriers that provision must also be made to offer lower fares to individual travelers.

An excursion fare is now being talked by some lines. Probable plan: year-round (not good on weekends) 23-day excursion, $300 roundtrip New York-London.

FINANCE

Braniff asks subsidy—Continuing losses in Latin America forced Braniff Airways to ask CAB for $3.1 million a year subsidy, excluding Mexico. In the year ended last June 30, the loss reached $1,118,000, and Braniff does not anticipate that domestic profits in the next year will offset international deficits.

Foreign competition, traffic restrictions by other governments, and rate policies of foreign carriers have contributed to the losses, Braniff says.

BILATERALS

Italian impasse—U.S.-Italian bilateral air talks produced nothing but stalemate. The U.S. wants Italy to furnish statistics on air travel and to classify the traffic under the various "freedoms" of the air. The Italians, however, claim that traffic beyond the home country is of no concern to the U.S.

U.S. position is that as long as statistics are not furnished, it won't consider granting Alitalia a route to Los Angeles. Some observers believe the Italians may now move to restrict U.S. flights into Rome. Others think they may denounce the present agreement and prohibit operation of more than one U.S. line to Rome.

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AMERICAN AMERICA'S LEADING AIRLINE

Will Sonic Booms Crush the SST?

Virtually all aspects of supersonic transport design hinge on this answer. Preliminary results of research by U.S. agencies hint that the answer will be NO

Government scientists are carefully measuring the sonic boom problem child to see if his latest adolescent growth foredooms the life of commercial supersonic aviation in the United States.

"Lift effect," his newest characteristic, already threatens to banish the supersonic transport to transoceanic or the most barren overland routes.

Many airline experts say this would leave free-enterprise supersonic aviation in the U.S. still-born—the SST a national prestige symbol flying its spectacular schedules over only a few heavily-subsidized routes.

But a NASA-FAA-Air Force sonic boom test program promises a fairly prompt answer to the biggest SST operational question, and at least one of its top officials already believes the answer will be: "We can do it."

By BRAD DUNBAR and DICK VAN OSTEN

THE ANSWER WILL COME from an extraordinary series of tests ranging from the supersonic wind tunnel of NASA's Langley (Va.) Research Center to some precise Mach 1-2 flights in Edwards AFB's supersonic corridor and then to the ultimate test that is standing bureaucratic hair on end from Edwards to Washington—the intentional "booming" of populated areas to pin down the threshold between "acceptable" and "unacceptable" sonic booms.

It was at Langley about a year ago that tunnel tests proved the existence and suggested the seriousness of sonic boom "lift effect." It dashed the comfortable theory that the Air Force's trouble-some "sound of freedom" could be neatly tucked away into the upper flight levels in commercial SST operations.

Century-series fighters, with their small cross-sections and low gross weights, generate virtually the same shock-waves at 60,000 ft. as at 10,000, and their boom diminishes fairly rapidly with distance from the ground. But sonic boom intensities were found to be variable not only with frontal area or fineness ratio, but also with the lift required to climb and cruise a given weight—a big factor in a 400,000-lb., 70,000-ft.-cruise SST.

Higher weights aggravate problem

Thus arose the gnawing fear that SST designers were sowing the seeds of the aircraft's operational destruction with their high-thrust turbofan engines for Mach 3 cruise at 70,000 ft. Boom intensity would rise with each pound of gross weight. The higher the altitude, the greater the lift required and the lounder the boom produced.

SST planners took prompt and often gloomy note of the phenomenon. Presentations to the first international SST conference—IATA's Montreal symposium last April—saw supersonic aviation as "quite infeasible . . . over practically all land areas" and "doubtful" over water, or as a long-range gamble on eventual public acceptance of initially unacceptable sonic booms. And almost to a man the symposium turned to NASA for solid test results that would describe the problem in numbers with which designers could work.

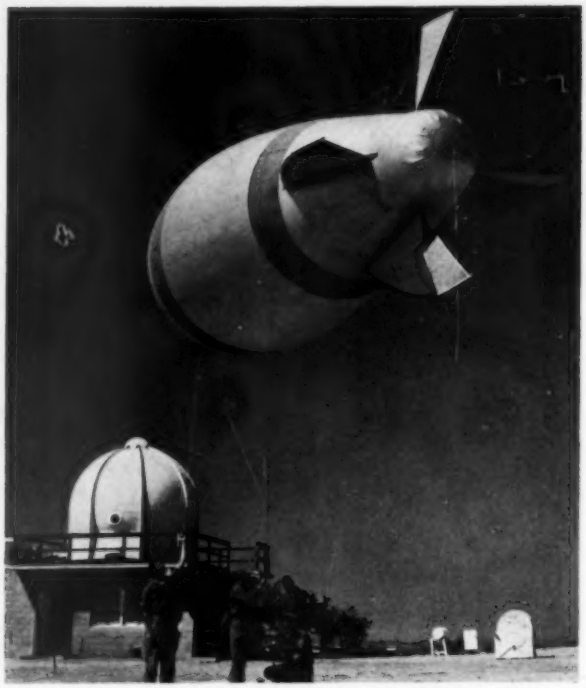
NASA, working jointly with FAA and the Air Force, now has its test program in the wind tunnel and over the Edwards desert. Specially-instrumented B-58, F-104 and F-106A aircraft—the latter a veteran of AF's "Project Roughrider" supersonic probes of thunderstorms—are flying precise patterns over a ground network of 14 barographs and a "ground-zero" seismograph. They range from 10,000 ft. to more than 60,000 ft.; their speeds, from Mach 1 to "beyond" Mach 2.

In some 50 flights, the Edwards program seeks to verify theoretical data and add new knowledge of boom intensities, atmospheric propagation and the effects of varying atmospheric conditions, angles of attack and flight maneuvers.

More than 20 flights will probe the "superboom" phenomenon which causes sharply increased overpressures as shock-waves focus or "catch up" with one another from supersonic turns or acceleration. Many suspect the superboom as the culprit in some of the worst of the Air Force's ground damage cases; NASA hopes to be able to learn just where and how hard it strikes from a given maneuver. One bright spot here is the liklihood that few if any of the maneuvers causing superbooms will be found in the operational SST's performance envelope.

Later flights will include 10 directly measuring altitude attenuation—the B-58 at varying gross weights will simulate as best it can the lift effect that will be experienced with the SST. Another six flights will continue previous NASA experimentation by sending the F-106A with its nose probe through the shock field of the B-58, with the F-106A passing the bomber from the rear at various separations. Initial tests have shown that close passes at low

NASA SST, one-inch scale model, used in boom research.

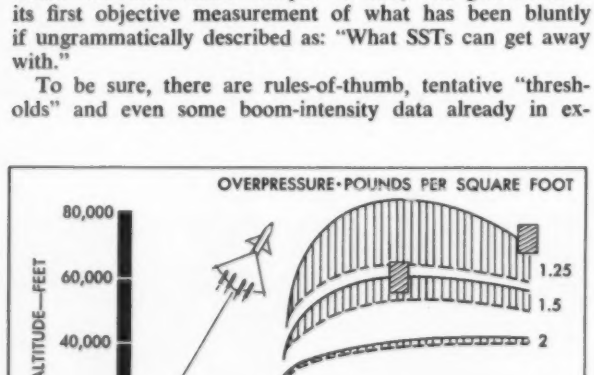


STUDY IN CONTRASTS. Airship-like weather balloon is used in boom research to take meteorological measurements.

altitudes can produce vertical tail loads approaching design limits, but no difficulty is experienced at normal ATC separations.

From Flight No. 50 on—no one will number them, even in round figures—the program plunges into the climactic "Community Response" phase which already had added years to the ages of countless project officials—particularly public relations personnel. Somewhere, over some U.S. cities, the B-58 and operational AF interceptors will make carefully-recorded supersonic passes. Their shock-wave intensities, measured against the reaction of the public on whom the sonic boom "carpet" is laid, will give aviation its first objective measurement of what has been bluntly if ungrammatically described as: "What SSTs can get away with."

To be sure, there are rules-of-thumb, tentative "thresholds" and even some boom-intensity data already in existence. Most students of the problem state generally that a sonic boom causing a pressure rise of 1 lb./sq. ft. is "tolerable," and that 2 lbs./sq. ft. begins the range of overpressures which can cause ground damage and thus should be considered intolerable. On this basis, a value of 1.5 has been "guesstimated" as a sonic boom threshold.



HOW GROUND OVERPRESSURE (figures at right) varies with both speed and altitude, plotted by NASA scientists.

A NASA paper delivered to a West Coast SST symposium of the Society of Experimental Test Pilots last month went so far as to suggest the "possibility" from studies of Edwards-area sonic booms that overpressures approaching 2 lbs. "may be acceptable." The survey of "random" flights showed 85% of the booms producing less than 1 lb. and only 3% more than 2 lbs.; none of them resulted in complaints or damage claims. The paper hastened to add, however, that the Palmdale-Edwards area is a 10-year veteran of the sonic-boom era, and the survey thus represents "the tolerance level that has been accepted by a specific populated area that is closely associated with the aircraft industry."

Actually, NASA, FAA and AF at *AIRLIFT* press time still were wrestling with the agonizing public relations problems of deliberate sonic booming even though the first flights were to have been made soon after Nov. 1. And there was more than the public relations phase still undecided. How many flights will there be? "We'll run 'em until I'm satisfied we've got an answer . . . though I hope to have it by the end of the calendar year," is the frank response of a top NASA project official.

From many, such a statement would be bureaucratic bravado. From John Stack, assistant Director at Langley, two-time Collier Trophy winner and one of the world's foremost authorities on supersonic flight, it carries the ring of blunt truth.

How it all "Stacks" up

The SST opinions of the man honored for his part in the pioneering X-1 program and for his development of the trans-sonic wind tunnel inevitably carry considerable weight. And Stack holds some very definite opinions about the SST and sonic booms:

- Sonic boom is likely to be "almost the sole determining criteria" for the SST's configuration and engine cycle.
- Probably none of today's configurations can do the job because their practical subsonic ceilings are less than 30,000 ft. and the SST because of the boom cannot go supersonic below 40,000 ft.
- Theoretical calculations of lift effect generally are proving out in wind tunnel and flight tests although data tends to "scatter" and curves somewhat below theory.
- Some experimentation indicates sonic boom intensity may be varied by as much as 25% by alterations in configuration, and optimum sonic boom configuration fortunately improves other SST characteristics—thus "licking the sonic boom problem probably will force better landing and takeoff speeds."
- There is "every reason to believe" that sonic booms will cause ground damage beginning at 2 lbs/sq. ft., and as yet no valid basis for saying "we can go any higher than 1." The threshold undoubtedly lies between the two figures—probably close to 1.25 for a 325,000-lb. Mach 3 SST at 70,000 ft. and between 1.25 and 1.5 for a Mach 2 at 60,000 ft.

But what of the one over-riding question—can the SST fly over populated land areas as a subsidy-free transport? Can last year's lift effect "surprise" that already has raised the SST's supersonic floor to 40,000 ft. be lived with even there?

"I don't see why we shouldn't be able to do it," says Stack," . . . assuming we don't run into any more surprises!" ■

PROTOTYPE Breguet 941 has been flying since last spring. It is proposed in passenger and cargo versions.

Breguet Out Front in STOL Design

Thirteen-year research program by French manufacturer has evolved into development of an economical STOL

By ANTHONY VANDYK
From Paris

AN ECONOMIC STOL aircraft that could revolutionize shorthaul air transportation has been developed by France's Breguet company.

This is no paper project or experimental design. The Breguet family of STOL transport (models 940, 941, 942 and 945) represent the fruit of a research program which has been conducted since 1948. And flight tests to prove out the system in the air have been under way since May 1948. In fact, the prototype 940 has made close to 1000 takeoffs and landings up to date.

The Breguet STOL system, mainly developed with French government funds, makes use of the deflected slipstream or "blown wing" principle. It involves a deflection of the air flow from the propellers downward by large flaps. Breguet uses four very large propellers so that the slipstream covers the whole wing span.

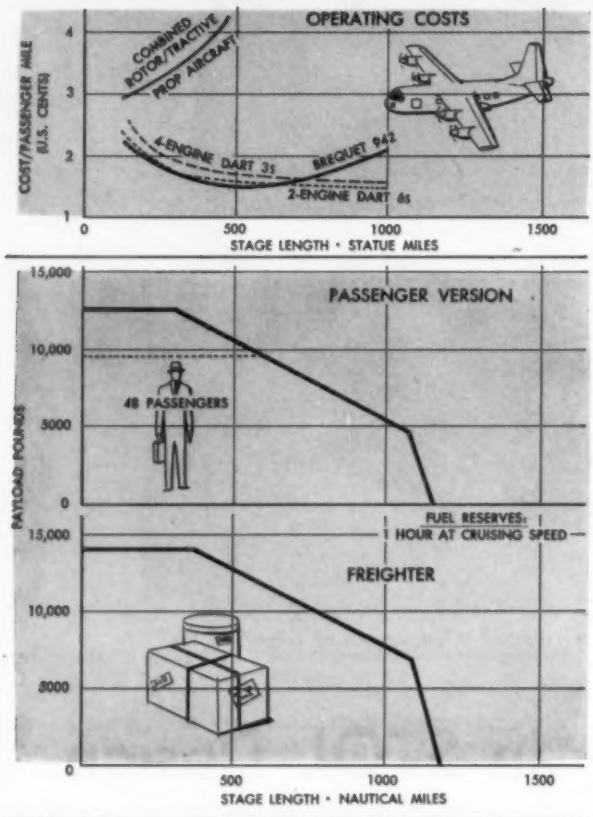
The "blown wing" principle allows an additional control to be used—differential pitch variation which is used to vary slipstream velocity and so assist lateral control. Differential variation of pitch settings on the port and starboard propellers is synchronized with control of the outboard flaps which act as ailerons.

This gives excellent lateral control and when necessary a directly induced yaw which enables sharp and precise turns to be made when approaching small and awkwardly situated airfields. A safety feature of the design is that aileron control is sufficiently effective even if a propeller

SPECS ON THE 941

		PASSENGER VERSION	FREIGHTER VERSION
EXTERNAL DIMENSIONS			
—Span		76.1 ft.	76.1 ft.
—Length		74.7 ft.	74.7 ft.
—Height		30.7 ft.	30.7 ft.
—Wing area		887 sq. ft.	887 sq. ft.
INTERIOR DIMENSIONS			
—Hold length			35.8 ft.
—Length of passenger cabin		30 ft.	
—Hold or cabin width		8 ft.	8 ft.
—Hold or cabin height		7.4 ft.	
—Hold volume.		350 cu. ft.	2,100 cu. ft.
WEIGHTS			
—Maximum take off weight		45,000 lbs.	45,000 lbs.
—Maximum landing weight		40,600 lbs.	40,600 lbs.
—Empty weight		26,670 lbs.	25,170 lbs.
—Maximum payload		12,480 lbs.	14,030 lbs.
POWER PLANTS			
—4 turbines	—Type	Turbomeca Turmo III D or DeHavilland "Gnome" (General Electric T58 licence)	
	—Power	4 x 1250 hp	
—4 propellers	—Type	Breguet-Ratier	
—Propeller diameter		14.75 ft.	

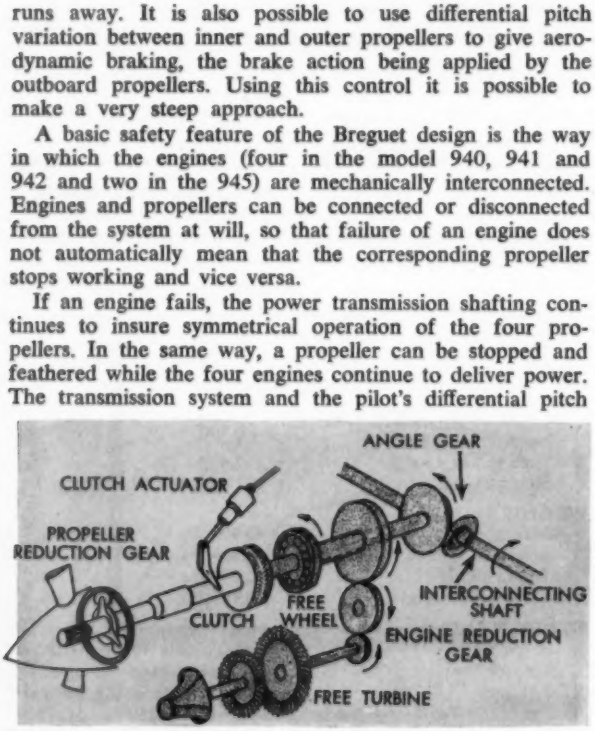
HOW THEY PERFORM



runs away. It is also possible to use differential pitch variation between inner and outer propellers to give aerodynamic braking, the brake action being applied by the outboard propellers. Using this control it is possible to make a very steep approach.

A basic safety feature of the Breguet design is the way in which the engines (four in the model 940, 941 and 942 and two in the 945) are mechanically interconnected. Engines and propellers can be connected or disconnected from the system at will, so that failure of an engine does not automatically mean that the corresponding propeller stops working and vice versa.

If an engine fails, the power transmission shafting continues to insure symmetrical operation of the four propellers. In the same way, a propeller can be stopped and feathered while the four engines continue to deliver power. The transmission system and the pilot's differential pitch control insure the best possible distribution of power and thrust even during take-off and approach.



SCHEMATIC of engine/prop interconnect system reveals versatility of Breguet design should engine or propeller fail.

Commercial operators will be attracted by the Breguet 941 and 942 STOL models. These two four-engine designs are basically the same except that the 941 is unpressurized while the 942 will be pressurized. Both will sell at $800,000 and will be capable of using airfields of 800 to 1500 ft.

Their approach and climb-out slopes make them suitable for operation from fields surrounded by high obstacles while low-pressure tires will enable them to use either hard-surface or grass runways. Although the Breguet STOL transports will fly as slow as 50 knots, they have a relatively high maximum speed (240 knots) and will cruise at 215 knots.

The economics and characteristics of the Breguet 941 and 942 will appeal to a wide range of operators. The direct cost per seat-mile (ATA formula) is about 1.5 cents for flights of 500 miles. In their passenger versions the aircraft can carry a maximum payload of close to 12,500 pounds for 375 miles. Maximum takeoff is 45,000 pounds and maximum landing weight 40,600 pounds. Zero fuel weight is 39,600 pounds. These weights apply to both the 941 and the 942.

Powerplant comprises four 1250-h.p. Turbomeca Turmo III D turbines but it would be possible to substitute the General Electric T58 if required. Overhaul life of the Turmo engine is expected to reach 1500 hours by 1963. The French engine has a specific fuel consumption of 0.665 pound/HP/hour for take-off and 0.590 pound/HP/hour in cruising flight. A Breguet designed propeller 14.75 feet in diameter is being manufactured by Ratier.

941 flying since spring

What is the status of the Breguet transports? The prototype 940 has been flying for nearly four years while the 941 prototype started its flight tests this spring. The production program depends on whether current interest, both military and commercial, transforms itself into orders.

The first production order may involve the Breguet 945, a 22,000-pound light transport powered by two Turmo 3D engines driving four mechanically-connected propellers. Main interest in the 945 is from the French military, but a commercial version would have obvious interest to operators wanting an STOL transport with smaller payload than that of the 941 and 942. Breguet has in mind a commercial derivative of the 945 grossing 24,250 pounds which would enable a 7800-pound payload to be carried for stages of up to 400 miles.

But the main commercial sales program of Breguet will involve the 941 and 942. The development of these designs has been carried out in close cooperation with the FAA office in Paris so the aircraft can receive U.S. certification. Among the operators that are following the Breguet program with interest are British European Airways and Air Inter, the French domestic airline.

Several operators in Brazil believe the 941/942 design has a tremendous potential in their country. Some suggest that it is the first aircraft with performance and economics that might make it a replacement for trucks and buses in remote districts.

If the Brazilian prophecies come true this will be no surprise to the Breguet company, which has as its Board Chairman Sylvain Floirat, who made his fortune from truck and bus transportation. Moreover, the 50-year-old Breguet company has an outstanding record in the design and production of transport aircraft.

Its double-deck Deux Ponts, still giving excellent service with Air France, is one of Europe's most successful transport workhorses. The STOL family promises to ensure that Breguet will continue to be a respected name in the air transport world for many years to come. ■

Study Pegs Local Air Markets

Two-year survey by U.S. local defines shorthaul passenger and why he travels by air

AS AIR TRANSPORTATION deeply ponders the problems of expanding its markets, there's one small airline that is making a big contribution toward finding out where to start.

The carrier is Ozark Air Lines, a local serving the U.S. midwest, which for the second successive year has documented for the record "who travels short distances by air and why." The project was spearheaded by S. F. McCullough, Ozark's v.p.-advertising and sales, and was developed and supervised by its advertising agency—Ratsif-George-Wemhoener of St. Louis.

The Ozark passenger survey started out to be purely a means of gaining information for advertising and sales efforts, but the results proved so useful the carrier has distributed them to all of its departments. Some examples:

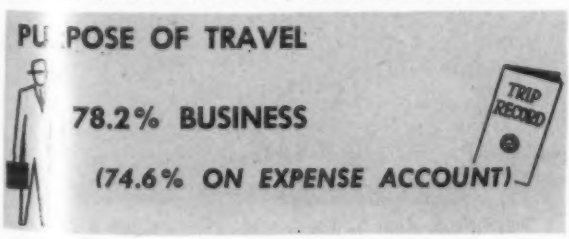
Source of traffic—65.5% of passengers resided on Ozark's route. A year ago the figure was 67%. Among off-line passengers (34.5%), New York State ranked first producing 7.6%. The New York metropolitan area accounted for 6.3% of *all* passengers surveyed.

Purpose of trip—Business travel accounted for 78.2% of the passengers. Similarly, 72.2% were expense account travelers. Pleasure travel contributed 10.4%; personal emergency 4.6%; personal business 4.3% and other 2.2%. In 1960 business accounted for 77.3% and pleasure 11.5%.

Occupation—Administrative, professional and sales personnel represent a combined 81.7% of passengers with administrative accounting for 46.7%, professional 23.8% and sales 11.2%. The housewife accounted for 8.2%, military 2.2%, students 2.2%, laborers 1.5% and others 3.8%.

Sex—More than four-fifths of passengers (82.5%) are male, but air travel by females is showing a slight increase over 1960. The rise from 15.3% in 1960 to 17.4% in 1961 is consistent with the national trend, Ozark officials conclude.

Age—Less than 1% of Ozark's passengers (actually 0.4%) are under 18 and 5% are 65 or older. The 18-24 year group accounts for 6.3%; 25-34 for 20.3%; 35-45 for 30%; 45-54 for 23.5%; and 55-64 for 10.5%.



McCULLOUGH

Income—More than 60% of all passengers earn less than $15,000 while almost one-third earn less than $10,000. In specific age brackets, those earning below $6000 accounted for 9.9%; $6000-$9000 (22.6%); $10,000-14,999 (29.1%); $15,000-19,999 (12.8%) $20,000-29,999 (9.9%); and $30,000 or over (9.8%). Balance of 5.9% declined to answer.

Trip time—Of all passengers, more than 70% were away from home four nights or less. Same-day returnees represent 12.6%; one night 18.1%; two-to-four nights 40.5%; longer than four nights 28.4%.

Connections—Almost two-thirds of all passengers (65.6%) are connecting with another airline. Of passengers originating "on line," 49.9% connect with another airline.

Ticketing—Of all passengers, 62.5% buy their tickets in their home city. Slightly more than 50% of "off line" passengers were ticketed on Ozark at their home city.

Reservations—Ozark was the reservations contact for 48.7% of passengers; other airlines accounted for 25.5%. Travel agents booked 19% and other sources, such as military services, company traffic departments, etc., accounted for 5.7%.

Credit cards—The airlines' "Air Travel Card" topped the list of credit cards held by passengers at 31.6%. Among others, 20% held American Express, 13.9% Hilton Carte Blanche, 12.9% Diners Club and 2.6% held Ozark's credit card.

Travel alternatives—Significantly, 8.2% of the passengers would not have made the trip if Ozark Air Lines was not available. Auto travel was the alternative for 40.2%, train for 37.1%, private plane for 6.9%, bus 6.1% and other means 3.7%. Although auto is first alternative for on-line passengers, the train ranks No. 1 for off-line passengers.

Frequency—The median number of trips for all passengers is about 10 per year. Two thirds traveled more than five times by air in 1960. Some 10.9% made no air trips in '60, 22.9% made fewer than 5; 28.1% made 6 to 17 trips; 16.1% made 18 to 38 trips; 10.4% made 39-65 trips and 10.9% made over 65 air trips.

The Ozark survey was made on all flights of May 24, 1961 and May 25, 1960. This year's edition involved 1913 passengers or 99.54% of the potential carried that day. Editing reduced the "qualified" return questionnaires to 1631 or 85.3% of the passengers carried. ■

HISTORIC POSE (L to R) Nyrop, Woolman, Six, Trippe, Austin, Smith, Tillinghast, MacIntyre, Patterson and Drinkwater. Beard and Baker are obscured by Austin and Smith. (See next page for affiliation.)

A Dozen Presidents Meet CAB

Historic gathering of airline heads on September 28 is captured in exclusive *AIRLIFT* photo report

Staff Photos by Phil Geraci

SEPTEMBER 28, 1961 was a milestone in U.S. air transportation, perhaps world air transportation.

For the first time in modern days, the presidents of 12 U.S. trunk airlines met face to face with the federal powers which regulate their destiny—the Civil Aeronautics Board.

For more than a year there has been talk of a "sick" airline industry—plenty of talk, but little positive action. Industry has been free with its criticisms of over-competition. Most often, CAB has been the target. Similarly, the carriers have been ridiculed for wasteful cabin frills, and unimaginative advertising designed to steal markets.

The cross-fire of barbs took a dramatic turn for the better on September 28. Contrary to the views of skeptics who beforehand doubted the value of the session, the meeting with CAB proved profitable on all sides.

Within a week, airline representatives were meeting to discuss cabin frills and no-shows. Within eight days they presented their managements and CAB with a four-point plan including: (1) elimination of free food service for coach passengers; (2) elimination of coach liquor service; (3) retention of 1st-class food service with sale or give-away of liquor at carrier's discretion; and, (4) elimination of 1st class and coach seat assignment.

Other results of the presidents' get-together with CAB are in the formative stages. A six-airline committee will study and report recommendations on no-shows. A meeting of airlines to discuss fares is awaiting CAB sanction.

So successful was the first session with the Board that there no doubt will be others. One subject, for example, intentionally ignored on September 28 was air cargo. A second top-level meeting on this highly debated area of industry development can be expected soon, possibly before the year-end. ■

CHAIRMAN Alan S. Boyd, who called session.

BRANIFF'S
Charles E. Beard

NORTHEAST'S
James W. Austin

DELTA'S
C. E. Woolman

PAN AM'S
Juan Trippe

TWA'S
Charles Tillinghast

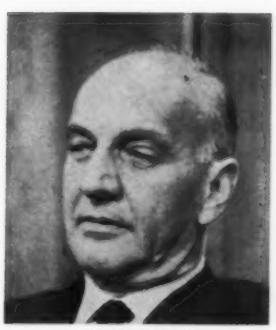
NORTHWEST'S
Donald W. Nyrop

UNITED'S
W. A. Patterson

CONTINENTAL'S
Robert F. Six

NATIONAL'S
G. T. Baker

AMERICAN'S
C. R. Smith

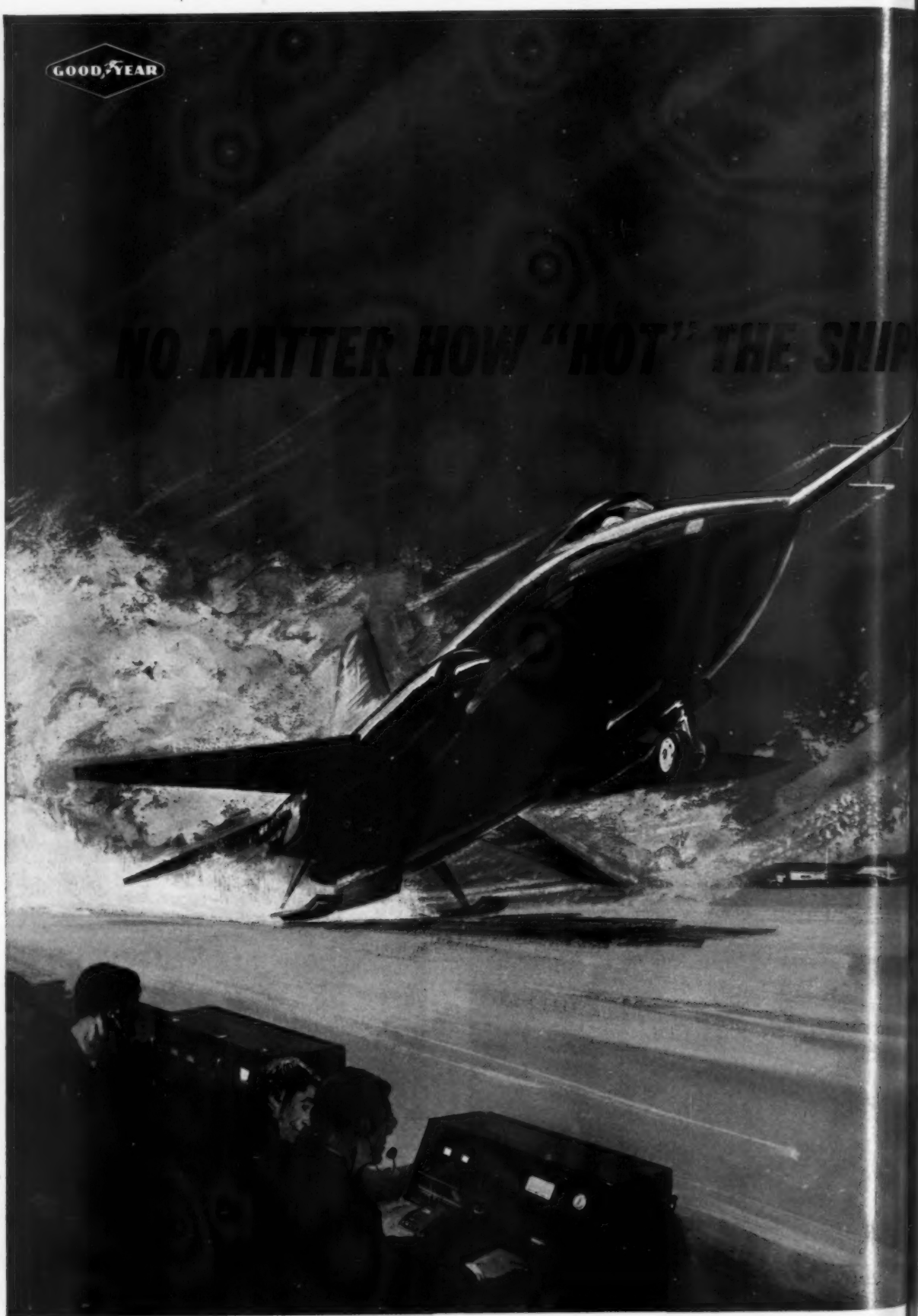


EASTERN'S
Malcolm MacIntyre

WESTERN'S
T. C. Drinkwater

PRE DENTS Tillinghast, Drinkwater and Patterson pose with AB member Whitney Gillilland (third from left).

MEMBER Chan Gurney and vice chairman Robert Murphy (center) with (l to r) Nyrop, Woolman, Baker, Beard, Smith.


GOODYEAR
NO MATTER HOW "HOT" THE SHIP

IF IT FLIES, GOODYEAR CAN LAND IT

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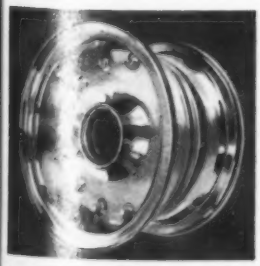
A braking system which never overheats!

Has no friction wearing surfaces – no heat retention (uses the atmosphere as a heat sink). Efficiency rises as landing speeds increase. Uses no liquids, is simpler than other systems of equivalent ratings. Operating costs? Low. Life? Long. Reliability? High. An *exclusive* Goodyear development proved on the nation's most extensive dynamometer testing facilities.

Automatic braking system helps take skid problems out of high-speed landings!

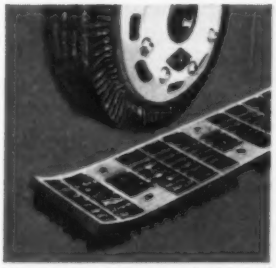
Automatically adjusts itself to runway conditions – prevents tire flat-spotting and skid blowouts – shortens stopping distance—instantly adapts the pressure of the brake to the coefficient of friction between the tires and *any* runway surface. Eliminates human element in aircraft braking. An *exclusive* Goodyear development of high reliability in being today.

Corrosionproof aircraft wheels that take 1,000°F!



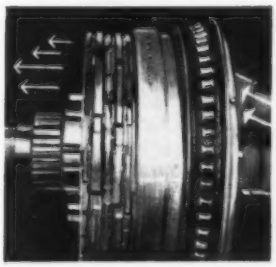
Fully tested and ready for production, new aircraft wheels of two never-before-used materials are corrosionproof – stronger and lighter than wheels currently used. One of these Goodyear wheels will withstand 1,000°F, keep tires cooler because they transmit heat at far lower rate. Thinner sections free more space for brakes. Better flexibility resists higher impact loads.

Wire tires & skids for the hottest landings!



You can't use regular tires on re-entry vehicles without incurring severe design penalties (re-entry heat bars exposed rubber). But you *can* use these *exclusive* Goodyear wire tires and skids. Made of a Goodyear-created high-temperature stainless steel, they give the "hottest" ships a landing capability for the first time – have the highest coefficient of friction of any landing skid system.

Cool solution for disc-brake heat problem!



Air-cooled brakes by Goodyear give disc brakes more capacity by eliminating overheating *without* increasing disc size and weight. Use no liquid, no hose, no complex pumping and cooling system—give you every "cooled" brake advantage without extra weight and cost penalties. Another advanced development *in being* at Goodyear.

For more information on these advanced wheel, brake and anti-skid systems, write Goodyear, Aviation Products Division, Dept. K-1735, Akron 16, Ohio.

Lots of Good Things Come From GOODYEAR

How to Schedule, Sans Committee

By MELVIN A. BRENNER *Vice Pres.—Schedules & Equipment Utilization Department at American Airlines since '59*

SCHEDULES REPRESENT THE OUTPUT of an airline—the product which it manufactures and sells. In essence, therefore, the job of schedule planning is one of "product" planning; it combines elements of "product design" on one hand, and "production planning" on the other. All departments and field offices of an airline are affected by, and have an effect upon, the schedule pattern which ends up in the published timetable.

The schedule planner must develop this overall service pattern so that it will achieve an optimum balance of many objectives. There must be: (a) good service to passengers, shippers, and communities; (b) dependable operating performance; (c) profitable financial results; (d) effective competitive impact and (e) efficient utilization of personnel and equipment.

The words *optimum balance* are deliberately chosen and highly significant. For it is literally impossible to satisfy simultaneously and equally *all* of these varied objectives, many of which inherently conflict with one another.

Examples: **Short ground times** are fine for efficient aircraft utilization, but they make the job of maintenance more difficult. **Tightly integrated connecting "complexes"** are desirable for maximum connecting revenue, but they create schedule "peaks" and inefficient use of station personnel.

Changing a one-stop schedule to a nonstop improves the service between the terminal points, but it weakens service at the previous intermediate point.

The real complexity of the schedule planner's job comes in the endless balancing between such differing objectives. Nor are we usually faced with simple "either-or" choices between two sharply defined alternatives. More often, our choices involve multiple, inter-related variables.

The 'committee' approach

Because of the wide impact of scheduling decisions, it has been customary in most companies to handle this function through a "Schedule Committee," whose membership is drawn from each affected department. American Airlines had such a committee until late in 1959.

At that time, as part of a company-wide reorganization, the Schedule Committee was discontinued and replaced by our present Department of Schedules and Equipment Utilization. Our department reports directly to the vice president and general manager, who in turn reports directly to the president.

First, this has permitted development of a staff whose sole mission is to develop the best overall schedule solutions to any given problem. It has been particularly gratifying to note how personnel previously "representing" one specific department on the committee (e.g., sales, or operations, or finance) have, under our new set-up, broadened their understanding of *other* corporate objectives.

Second, it has created a more clear-cut accountability for scheduling actions. Like any committee, the previous Schedule Committee tended to divide responsibility among all its members, leaving no-one solely accountable.

Third, it has enabled us to act with greater expedition, and less duplication of effort, than with a committee.

Abandonment of the committee arrangement has eliminated the "voting" participation of each department in the schedule-making process. Obviously, this has *not* reduced the vital importance of keeping all other departments informed of our schedule plans and of giving them an opportunity to offer comments, criticisms, and suggested changes.

To provide this opportunity, our department has established continuous communication and coordination with all other staff departments and with field stations. From the first "gleam in the eye" to the final printed timetable, a proposed schedule will be the subject of discussion with dozens of individuals, representing all areas of the company.

Reorganization eliminates regions

Among other important changes, our 1959 company reorganization eliminated American's former regional structure; instead, each station now reports directly to the general office. Whereas field coordination previously required communication with only five regional offices, we now communicate directly with some 50 stations.

While this means more work for our department, the direct line of communication to individual stations has had a two-way benefit. It has given scheduling personnel in the general office a clearer appreciation of the schedule problems as viewed by local management in the individual stations. At the same time, it has enabled the stations to gain from us a better understanding of system-wide schedule problems.

At least once a month, each city manager has the opportunity to comment on schedule plans for future months. In such comments, they are quite vigorous and vocal in representing the needs of their respective communities—indeed they are usually just as forceful in this regard as any Chamber of Commerce or other civic representative.

By and large, we have had a good "batting average" in meeting the specific requests submitted by our city managers. Naturally, we cannot always do exactly what they request—sometimes for operational reasons, sometimes for economic reasons. And sometimes a suggested change would merely gain an improvement for one community at the expense of down-grading service for another.

This last point deserves special emphasis. In the complicated, inter-woven structure of an airline's overall schedule pattern, it is rare that a schedule change can be accomplished as a clear-cut, undiluted gain. More often, it will cause some offsetting penalty elsewhere. We are frequently confronted, for example, with a request to add City A to an existing schedule, but doing so would require removal of City B.

In most cases, we can readily agree with the city making the request that the proposed change would yield improved service for *that* city. But the question must still be considered whether, on net balance, this improvement outweighs the problems caused for other cities.

In short, we usually find that matters of schedule improvement involve *relative* rather than *absolute* values. They range through all shades of grey, rather than presenting clear-cut choices between black and white. What we do seek to achieve is a balanced overall pattern, yielding the best service for the largest number of potential users.

In this goal, we are not basically different from any other public service industry, or indeed any other form of commercial enterprise. In the final analysis, our success depends upon our ability to: (a) provide what the public wants, and (b) do so at a profit. Fortunately, the two parts of this goal point in the *same* direction more often than they conflict; our greatest hope for profitable operation lies in correctly judging what the public wants, and supplying it. ■

Douglas Ponders New Twin-jet

Model 2086 economy is slanted at shorthaul service, but range would extend upwards of 1000 miles

DOUGLAS AIRCRAFT CO. is sounding out airlines on a small jet transport design having a maximum gross weight of 69,000 pounds. It would cruise at Mach .80 at 25,000 feet.

Presently called the Model 2086, the proposed aircraft is configured specifically to operate economically over stage lengths of 500 miles and less. But it also would be capable of operating at ranges in excess of 1000 miles.

Douglas puts direct operating costs at less than a dollar per mile for all ranges in excess of 300 statute miles. Seat-mile costs are as low as 1.2¢ for a high-density coach arrangement and 1.4¢ for first-class.

The aircraft is proposed with two Pratt & Whitney advanced JTF10A-2 turbofan engines developing 10,000 pounds thrust at sea level and 3400 pounds for max. cruise. Optional power could be Rolls-Royce RB163-2 which develops 10,400 pounds thrust at sea level and 3750 pounds for max. cruise.

Physical size of the Model 2086 is approximately the same as that of the Convair 340 or the Viscount 810. The airplane is 95.3 ft. long. Wing is swept 24 degrees. Span is 84.7 ft. Engines are mounted on the aft fuselage.

Interior arrangements provide accommodations for 56 first-class passengers in five-abreast seating spaced at 38 inches or for 77 coach passengers in five-abreast seating spaced at 34 inches. A divider partition permits a 68-passenger mixed-class arrangement numbering 16 first-class and 52 tourist.

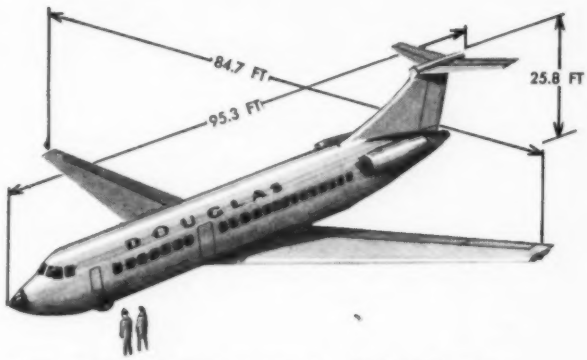
Interior appointments include two lavatories, one at each end of the cabin, two coat rooms and buffet facilities. Main cabin door is located near the wing-fuselage junction for loading of entire cabin through one door. This saves weight of a second door and the location makes it possible to operate the right-hand engine at idle thrust while loading or unloading passengers or cargo. Hinged door has integral steps.

Carry-on luggage outside

Douglas employs a design innovation to provide for carry-on luggage without robbing the main cabin floor of passenger space. This is accomplished with an external pull-out rack of 65 cubic feet capacity which is located in the underfloor of the fuselage just forward of the door. One man can operate it in and out of the aircraft. Additional cargo and luggage volume is accommodated in the lower compartment both forward and aft of the wing and in the aft-most portion of the cabin between the engines for a total volume of 660 cubic feet.

Fuel capacity is 17,150 pounds with one main and one auxiliary tank in each wing panel. Additional range can be provided by installing a center wing fuel tank boosting total capacity to 23,450 pounds.

Douglas says the Model 2086 could carry full capacity 77 coach passengers for a range of approximately 500 miles and it could carry 56 first-class passengers for a range of 1000 miles. Ranges flown in day-to-day operation could be expected to be less than the maximum range provided, thus making it possible for the aircraft to operate over several shorter segments consecutively without refueling.



NEW DOUGLAS JET as seen by AIRLIFT'S artist.

The Model 2086 is designed to operate from a 5000-ft. field on a 90-degree day, carrying 56 passengers for a 300-mile range. Douglas points out that traffic is low at fields where runways are under 5500 feet.

Douglas describes the moderately swept wing design as achieving both high cruising speed characteristics and high lift capability. Wing area is 925 square feet. The high lift system consists of a 34% Douglas double-slotted trailing edge flap that extends to 67% of the semi-span. No leading edge devices are proposed.

Manual aileron, plus spoilers

Wing structure is a basic two-spar construction with integral fuel tanks. Lateral control is provided by a combination of a manual aileron operating through a spring tab and wing spoilers powered by hydraulic actuators. The spoilers also are used during landing ground roll to spoil lift on the wing. Longitudinal stability and control requirements are satisfied by a fixed horizontal surface mounted in a "T" position on the vertical tail.

Cabin pressurization is a direct engine bleed system with the maximum pressure differential of 7.41 psi allowing operation at an altitude of 30,000 feet with a cabin altitude of 6000 feet. Air conditioning and temperature control are provided by dual 3.3-ton freon system.

The Model 2086 incorporates a 400-cycle, three-phase electrical system with each engine driving a 30 KVA brushless generator through a constant speed drive unit to supply ac power to two individual ac load buss bars. Two transformer-rectifiers supply necessary dc power for the aircraft. Emergency electrical power system consists of two 12-volt batteries connected in series and utilized with solid state inverters.

A single 3000-psi hydraulic system, using Skydrol, operates landing gear, wing flaps, spoilers, nose wheel steering, air stair and wheel brakes.

Landing weight of the Model 2086 has been established at 65,500 pounds, which is 95% of the maximum takeoff weight, thus eliminating the need for a fuel dumping system. Main landing gear is dual wheel.

Douglas contemplates operation of the Model 2086 by a flight crew of two, but provisions are included in the cockpit for an observer. ■

Cores, like the one above, are cut from soil-cement pavements and show that the strength of pavement increases with age — as much as 100% in ten years. By the end of 1960, over 60 million sq. yds. of soil-cement pavement had been constructed.

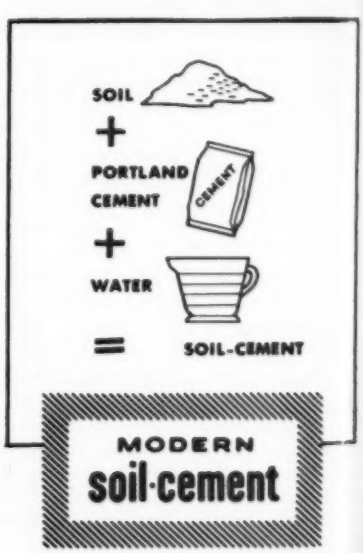
For small and medium-size airports . . .

high-strength pavements of soil-cement cost little more than turf runways!

Up to 75% of the materials are free! Soil-cement is easy on the budget —and meets all specifications for general aviation traffic. Many small airports with scheduled airline traffic also utilize soil-cement pavements. Runway builders work with free materials on hand—native soil or even broken-up blacktop or gravel from an old runway. Mixed with portland cement and water right on the site, rolled and topped with bituminous coating—the pavement's completed. Total cost is often no more than the cost of grading, stabilizing and sodding for a turf runway.

And this is *precision-built* pavement that grows stronger year after year. It's stronger inch for inch than any other paving material short of concrete. Its beam strength spreads the load over the subgrade. No potholes, washboarding or soft spots. Upkeep stays low.

It's easy to see why soil-cement is being specified more and more—not only for roads and streets—but for runways wherever low-cost pavements are called for.



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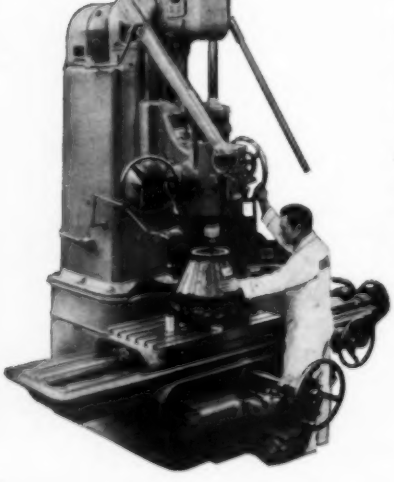
Curtiss-Wright dynamometer test cell assures overhauled engines meet performance specifications.



Overhaul to Factory Standards Costs Less!

Curtiss-Wright — the original manufacturer — unquestionably has the most complete and extensive experience in the overhaul of its Turbo Compound and other Wright piston engines. This experience, together with the most advanced equipment, enables skilled Curtiss-Wright specialists to accomplish superior quality repairs, reworks and modernizations "on schedule" with outstanding efficiency. Two strategically located facilities with complete inventory responsibilities are maintained by Curtiss-Wright. Both are supported by engineering, metallurgy and quality-control facilities to ensure the highest degree of engine reliability and ultimate lower overall costs to the operator.

For fully illustrated brochure or more pertinent facts on Curtiss-Wright Overhauls, phone or write Sales Manager.

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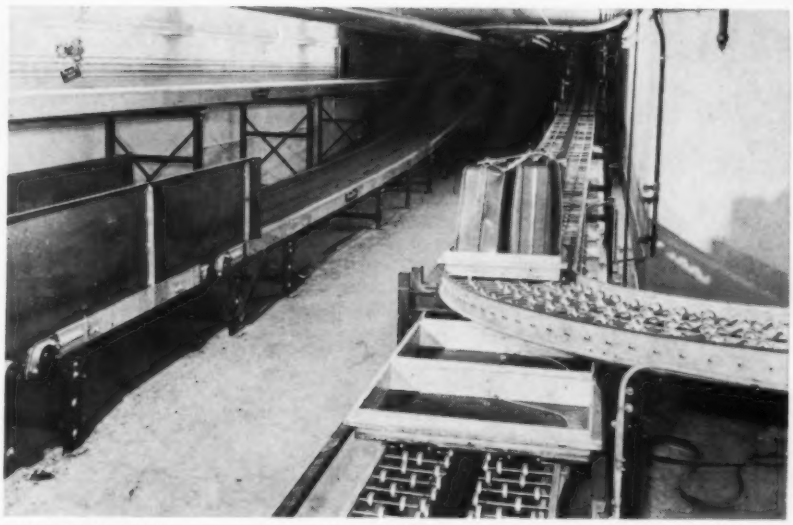
United Breaks Baggage Bottleneck With $500,000 System at L.A.

Magnetic memory and high-speed conveyors combine to deliver incoming bags in 2.5 minutes

AT CHECK-IN, agent codes tray by flight and routes bags to storage area.



UNDERGROUND, conveyors moving at 500 fpm carry tray until flagged electronically by scanners and diverted onto flight storage line.

A NEW MECHANIZED BAGGAGE handling system designed to outrun the airline passenger between plane and claim area is now in operation at United Air Lines' Los Angeles International Airport terminal.

The $500,000 system, tailor-made for UAL by Rapids-Standard Co. of Grand Rapids, Mich., combines some 6000 ft. of roller conveyors, a magnetic coded memory and the 185 hp of 152 electric motors to speed the luggage through an underground storage area.

At express check-in counters, an agent codes the baggage by flight number and dispatches it on a 500-fpm conveyor to a storage area where pre-coded storage lines await it. Trucks carry it the rest of the way to the plane.

The trip from check-in to plane takes 3 min. 7 secs. From plane to claim, it's only 2.5 min. At peak demand, anticipated by United about 1971, it will handle the baggage of 1500 passengers per hour. ■

ON FLIGHT-LINE, bags are shifted from conveyor to loading truck for rapid movement to aircraft on ramp.

ON INBOUND FLIGHTS, bags are whisked on 5 mph conveyors as passenger walks at 2 to 3 mph from plane to pickup.

Depreciation Can't Cure All Ills

Equipment write-offs, however attractive on paper, are no substitute for business

By SELIG ALTSCHUL

Depreciation and amortization charges have been seized upon by many in and out of the industry as an elixir capable of doing many things—retiring old debts, providing down payments on new equipment and increasing cash dividends. It will do all of these things, but only one at a time.

Moreover, in some quarters, there is a fallacious belief that depreciation and amortization charges automatically "generate" cash.

There can be no such bland assurance. To become an effective source of cash, these charges must be adequately covered by operations. By no means does this become an automatic exercise.

To be sure, in referring to depreciation as a "source of cash," only a limited application is being made. It is true in the sense that, after services are performed with fixed assets utilized in the operation, the cash equivalent of depreciation need not be paid out immediately. While labor and fuel bills must be paid often and regularly, the amount of money represented by depreciation is poured into fixed assets only at times considered desirable by management. In the meantime, cash resulting from these depreciation charges may be used for almost any corporate purpose. Fixed assets, however, must be replaced eventually and when that time comes it is management's responsibility to have the necessary funds available.

Rational distribution

Fundamentally, depreciation aims to distribute in a systematic and rational manner the cost of a tangible capital asset, less salvage value, over its estimated useful life. It is a process of allocation, not of valuation. The purpose of the depreciation charge and its concomitant reserve is to retain the integrity of the original capital. In this respect, aside from the general inflationary increases, the airlines have been faced with sharply rising costs for each successive series of aircraft.

This is clearly evident in tracing progressively rising price tags starting around $100,000 for a DC-3 more than 20 years ago to something like $5.5 million at present for a DC-8. Hence, depreciation, at best, can do no more than protect the integrity of the original capital investment for an asset.

Depreciation and amortization charges are constantly taking a larger bite out of gross revenues (see table). They will probably continue to rise and may not reach a peak until 1962—at the earliest. This is nothing more than a reflection of the additional jet equipment introduced in recent years plus aircraft scheduled for delivery through next year.

Piston aircraft, either in service or being retired, enjoyed a lower original cost and thus lower amortization charges than their jet replacements. A modern jet with a capital cost of about $5.5 millions computed over a straight 10-year life and 15% residual value, involves an annual depreciation charge of around $467,500. By contrast, a DC-7C costing about $2,250,000, same residual value but using a 7-year life, incurs an annual depreciation charge of around $273,000. Of course, greater productivity and lower unit operating costs (per seat-mile) lead to improved profitability which more than justifies buying the larger equipment.

Earnings essential

The fact remains, nevertheless, that this equipment must be gainfully utilized to justify the larger original cost and to support the heavier depreciation charges.

Unless gross revenues grow much faster than in the past, depreciation will command an ever-widening slice of the revenue pie, thus exposing the industry to greater risks.

For 1960, 11.4% of the domestic trunks' gross revenues were consumed by depreciation, the highest for any year. Results thus far indicate that 1961's bite will go much deeper.

The margin remaining in operating profits—after depreciation—has become minimal in recent years. It is non-

continued on page 32

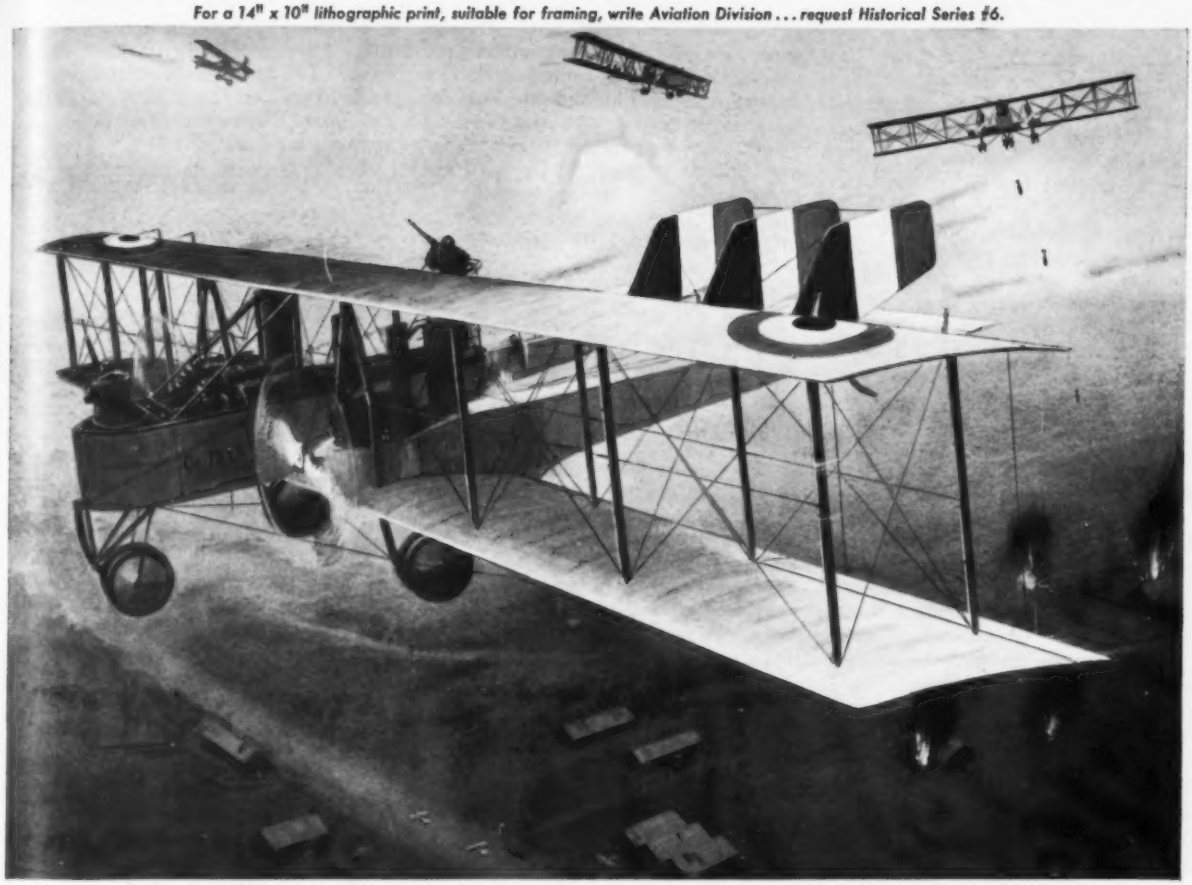
Depreciation Vs. Revenues and Profits

Domestic Trunk Airlines
(Dollars in millions)

	Gross Revenues	Operating Profits*	Depreciation & Amortization	Depreciation & Amortization To Gross Revenues	Depreciation & Amortization To Operating Profit*
1955	$1,133	$136.8	$102	9.0%	74.6%
1956	1,263	120.1	106	8.3	88.3
1957	1,420	55.9	147	10.4	263.0
1958	1,513	106.1	139	9.3	131.0
1959	1,799	125.9	172	9.7	136.6
1960	1,943	49.9	217	11.4	434.9
1961 [1]	817	(18.9) [2]	109	13.3	...

* Plus capital gains. [1] First five months, 1961. [2] Net operating income only.

For a 14" x 10" lithographic print, suitable for framing, write Aviation Division . . . request Historical Series #6.



September, 1918—Italian Caproni Bombers, flown by U. S. pilots, attack an airfield behind the Austrian Lines.

Early War Birds— THE CAPRONI CA 33 BOMBER

This World War I plane attests to Italian leadership in the early development of heavy aircraft. Evolving from the 1914 Caproni Ca 31 (one of the first successful trimotors), the Ca 33 was used extensively on the Italian Front from 1916 until the Armistice . . . and in small numbers on the Western Front during 1918. When powered by three 180-horsepower Isotta Fraschini engines, the Ca 33 had a top speed of around 85 mph, a service ceiling of 16,000 feet, and an endurance of 6 hours. It was manned by a crew of four—pilot-bombardier, co-pilot, forward observer-gunner, and rear gunner. It carried from 800 to 1000 pounds of bombs and was armed with two to four machine guns.

After the United States entered the war, a number of Americans, under command of Major Fiorello LaGuardia, were trained in Italy and attached to Italian bombardment squadrons. From June, 1918, until the Armistice, these U.S. pilots took part in some 65 missions with their Italian allies.

On one such mission, 20 Capronis and their escort planes took off from a field near Padua to bomb an enemy airdrome some 20 kilometers behind the lines. Flying along the Adriatic coast northeast of Venice, they skirted the Austrian trenches and arrived over the target undetected. As the Capronis finished their bomb runs and were making for home, they were jumped by enemy "fighters." In the ensuing engagement, the Ca 33 piloted by an American, Lt. Willis Fitch, was hard hit. Like angry hornets, the enemy single-seaters swarmed around his Caproni. The center engine was shot up . . . and an observer seriously wounded. Fitch scrambled forward and, taking over the observer's guns, managed to shoot down one of the attackers. Finally, the enemy was driven off by the escort planes . . . and Fitch's Caproni limped home on two engines, with shot-up control surfaces barely functioning.

Lt. Fitch flew more missions, and was twice decorated by the Italians. LaGuardia, too, flew many missions and was decorated. They came home, but many did not.

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continued from page 30

existent thus far in 1961 for the domestic trunks.

In 1955 and 1956, the group could have "covered" depreciation at least once again. Not so in subsequent years. Thus far in 1961 full depreciation and amortization charges were not even "covered" by operating profit.

Residual operating profits must provide adequate coverage of interest to say nothing of affording a rate of return to the equity.

As noted here recently (*AIRLIFT*, Sept.), interest charges have been mounting rapidly, increasing from $6.9 million in 1955 to almost $44 million in 1960.

While banks and other lending institutions, in making airline commitments, are influenced by expectations of profitability on the part of the borrower, nevertheless they generally key these loans to the level of depreciation "throw-offs" anticipated. To the extent such depreciation charges are not earned, the deficiencies will be taken out of the stockholders' equity. Under such circumstances, equity positions can deteriorate rapidly.

In the final analysis the holder of airline debt recognizes that an adequate flow of earnings for interest and repayment is his best protection. For an airline to obtain funds through the issuance of senior securities, a solid equity base must be established. Earnings must be sufficient to pay, at some time, adequate dividends with a margin of safety, not only for the sake of the dividend but for the well-being of the company. The equity is the base which supports the financial pyramid. Earning power—past, present and potential—remains the fulcrum upon which the financial fortunes of the industry rest.

Depreciation exceeds earnings

Major re-equipment programs, based upon expectations, have been largely fueled by cash "throw-offs" generated through depreciation. During the past six years the domestic trunks obtained almost $1 billion from this source, compared with only $255 million from net earnings.

In an analysis for Project Horizon it was determined that for the 1961-1965 period U.S. trunk and major international carriers had a total cash requirement of $2.54 billion, of which $1.9 billion was for equipment acquisition and the balance for debt retirement. To meet these requirements, $1.8 billion, or over 70%, is being anticipated from depreciation and amortization charges.

The progressive development of the airlines is achieved by incorporating the latest technological developments in successive waves of new equipment. Depreciation has been applied either to pay past obligations or to provide down payments on new equipment—with considerable commingling with other funds. As the volume of operations has grown, so have commitments in equipment and supporting capital structures—primarily as represented by debt. The U.S. certificated industry had increased its long-term debt from $273.8 million at the end of 1955 to $1.5 billion by December 31, 1960. Net equity during this period increased from $667 million to only $960 million.

The fact remains that the airlines now have a requirement to retire this debt in an orderly fashion. Premised on basic earning power, depreciation cash "throw-offs" are largely projected to meet these debt maturities. ■

Altschul's Views on Horizon

Selig Altschul, AIRLIFT's contributing financial editor, was a member of the task force which framed FAA's "Project Horizon" report. He dissented on two significant aspects of the final report—marketing and cargo equipment loans. The text of his dissents is printed in full below.

Marketing—Progressive management in all of its facets has my unqualified support. However, there is overemphasis accorded the role of marketing and the contributions to new traffic flows which can be expected from marketing techniques. An erroneous impression is created as to the potential traffic volume that might be developed by such marketing techniques.

First, there is a presumption that the industry has done little to date in these areas. This is an unsupportable position—not only in respect to marketing activities of the airlines themselves but ignores the tremendous marketing activity of the entire travel field, including all agencies promoting travel.

Second, there is an assumption that there is a latent volume of business waiting to be tapped and which is not reached by existing institutions of all types. On the contrary, while it is true that the majority of the population has not flown, by and large, they have no real desire to travel.

Third, there is an underlying assumption that air travel demand is very elastic so that substantial volume of business will result from what are minor changes to just one segment of the total travel picture. In actuality, there are many factors which can and do influence the demand curve for travel.

On the other hand, there is a real requirement that the individual airlines be encouraged to improve all management techniques with particular emphasis on product cost analysis. By increasing its unit productivity, without impairment of safety standards, the industry should be in a better position to pass on savings to the public by effecting reductions in fares.

Cargo loans—I am an advocate of developing air cargo. I am not in favor of government-guaranteed loans for cargo aircraft as they will not, in themselves, stimulate air cargo development.

As efficient low-operating cost air cargo aircraft become available, adequate credit will be forthcoming through conventional channels to finance the acquisition of such equipment. Further, those carriers enjoying a government guarantee on any of their loans will be given an inequitable competitive advantage over those airlines without such guarantees.

Viscount Costs: U.S. vs. India

Comparative operating costs on any airline aircraft operating in two widely separated points on the globe are not easy to come by.

But there are exceptions to most every situation and Indian Airlines Corp. through its astute financial controller, Mr. J. S. Parakh, gives *AIR-LIFT* the rare opportunity of comparing the U.S. and Indian operating costs on Vickers Viscounts.

Here's how IAC's controller analyses the differing cost situation for costs covering the 1960 (see table):

"Our total aircraft operating expenses are slightly less, at 97.92¢ per mile, as against 104.7¢, 100.8¢ and 124.8¢ of CAP, CAL and NEA.

"Since revenue utilization and flying hours can make a fundamental difference, a good comparison could be between IAC and NEA. Both have flown 25,000 revenue hours and the utilization also is very close. Also, NEA operate Viscounts 700, same as IAC.

"Taking item by item, crew salaries are very low in IAC. This is partly due to the lower wage structure of the country, but also due to certain stringent practices, i.e. we have no flight time limitations and our pilots fly even over 80 hours per month off and on.

"Our crew strength is therefore quite economical. We believe in paying overtime rather than increasing the strength of the crew. It pays dividends. On the other hand, we also engage Radio Officers and to that extent our costs would be more than U.S. operators.

Fuel costs high

"Fuel and oil: Our cost per hour is tremendous. This is so, in spite of the fact that our consumption of fuel per hour is the lowest, because the price of turbine fuel in India is very high. It is nearly 30¢ per Imperial gallon. If we could get fuel at the U.S. rate our Viscount operating cost would be no more than 80¢ per mile.

"Our insurance costs are a little on the high side. We pay 5% premiums on full value and insure our aircraft at average market values. CAP and CAL show lesser costs per hour presumably due to much higher flying hours which absorb this type of cost.

"Under maintenance, the lower labor cost in IAC can partly be attributed to the lower level of wages. Here again, we limit the technical staff strength to a conservative figure and pay overtime when necessary rather than employing more men with a perpetual burden on the wage bill.

"Please note that our maintenance costs are substantially lower than others in spite of these facts: (1) We have not very many automatic machines and time saving gadgets; (2) Our overhaul-periods for airframes and engines are rigid and not as favorable as the U.S. operators; and, (3) The source of supply of the spares is further away than in the case of U.S. operators, resulting in higher freight costs and more time lag in provisioning.

"In spite of these handicaps, our material costs are lower than those of the U.S. operators, and I have no further explanation except that we do all our maintenance and overhaul jobs ourselves under strict supervision.

"Depreciation—our figure is low. That is perhaps due to the fact that we write-off both airframes and engines in ten years, leaving a residual value of 10%. The U.S. adopts a shorter life. But as against that, our float of spare Dart engines is a bit too high. We have a spare-engine float of 70% over the number installed which is too much. I don't suppose the U.S. operators stock more than 50% of the installed engines as spares.

"Another reason for our low depreciation cost is our lower provision for obsolescence of spares. We hope to step that up in the future. That will bring depreciation up by another 2¢ per mile.

"You will find that our passenger load factor is significantly higher than the U.S. We are lucky—we have no competition on most of our routes, but on the other hand, we employ the Viscounts only on such sectors we know will pay the most.

"The higher load factor is again evident by the 32 passengers we carry per mile as against 25, 25 and 28 of the three U.S. airlines.

"The cost per seat-mile in IAC would automatically be lower than others due to its lower cost of operation. CAL has a lower seat-mile cost due perhaps to the higher average speed per hour. Their average is 262 miles per hour as against 239 of IAC.

"Our cost per passenger-mile is also obviously low because of lower cost of operation.

"It is in the average flight length that IAC finds itself in a very favorable position. Its average sector of 692 miles enables it to utilize the Viscount to the maximum advantage, as against the poor and uneconomic stage lengths of the U.S. operators. Here IAC has a definite advantage, but then, this situation is the result of selection of the right type of aircraft for the routes.

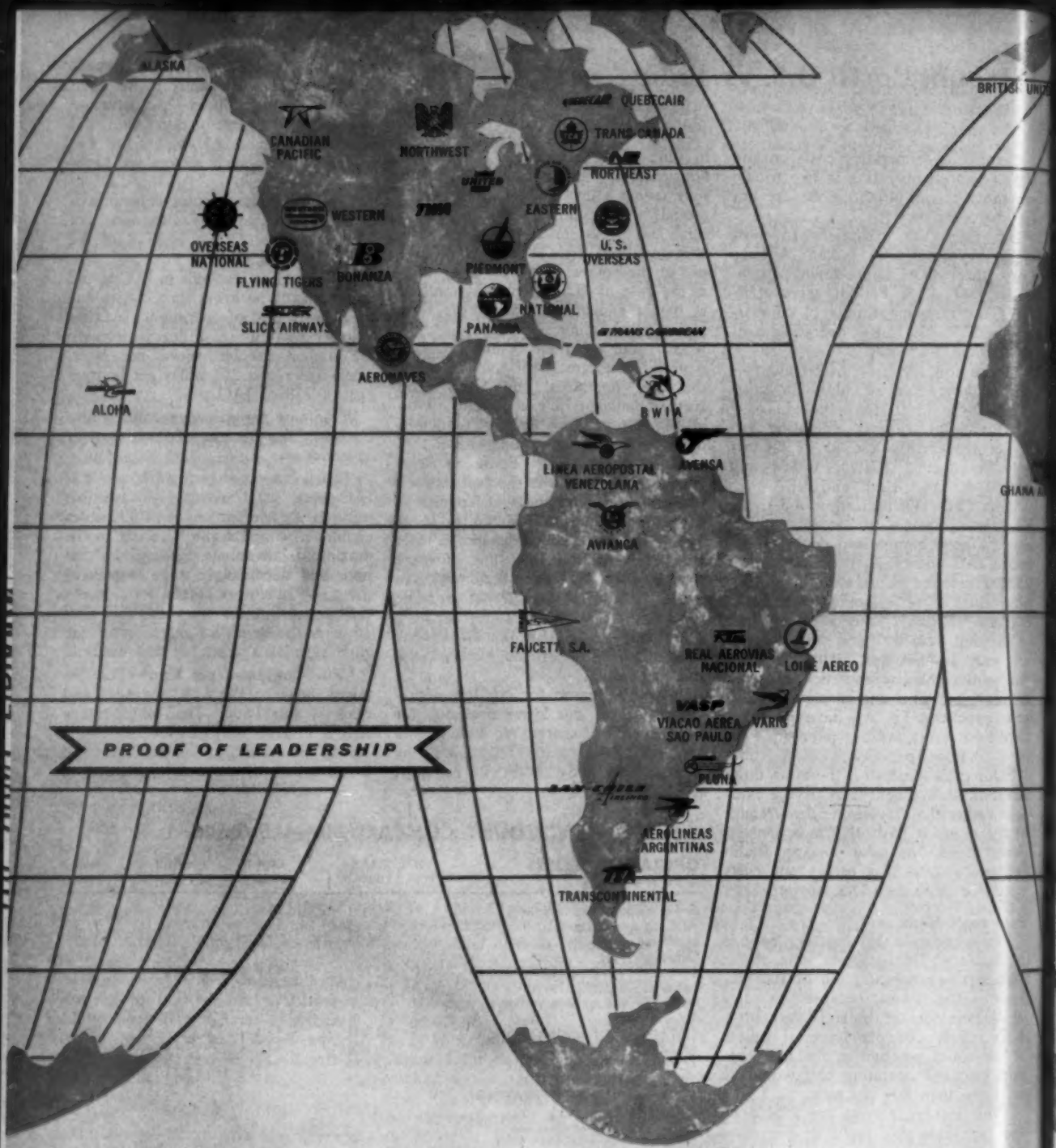
"Fuel consumed per hour—The disparity between the U.S. averages and ours is too wide. The longer stage length in IAC may account for some saving in consumption-per-hour but certainly not to the extent revealed. ■

VISCOUNT COMPARISON—U.S./India

OPERATING COSTS (¢ per revenue mile)	IAC (1960-61)	CAP (1960)	CAL (1960)	NEA (1960)
Crews salaries and expenses	9.79	24.5	21.7	22.2
Fuel, oil and taxes	38.75	22.6	22.9	24.5
Insurance	5.20	2.8	3.2	6.0
Others	....	....	....	....
TOTAL FLYING OPERATIONS	53.74	49.9	47.8	52.7
Labor	5.96	10.5	8.7	12.4
Materials and outside repairs	10.82	11.1	13.6	14.6
Reserves	....	....	1.0	2.7
TOTAL DIRECT MAINTENANCE	16.78	21.6	23.3	29.7
Maintenance, indirect	11.02	13.2	9.4	15.9
TOTAL MAINTENANCE	27.80	34.8	32.7	45.6
TOTAL DEPRECIATION	16.38	20.0	20.3	26.5
TOTAL AIRCRAFT OPERATING EXPENSES	97.72	104.7	100.8	124.8

(Note: IATA Rate of conversion is adopted which is Rs .476.2=$100)

STATISTICS				
Hours flown (Revenue)	25,081	181,763	36,605	25,588
(Training)	160	1,498	472	491
(Others)	182	1,264	169	109
(Total)	25,423	184,525	37,246	26,188
Revenue utilization	6:53	8:55	7:08	6:59
Revenue aircraft miles	5,994	44,077	9,626	5,738
Passenger load factor-first class	74.2%	56.8%	47.3%	64.8%
Passenger load factor-coach	74.2%	51.7%	49.2%	41.0%
Average seats per mile	44.0	44.8	52.1	44.0
Average passengers per mile	32.6	25.2	24.7	28.1
Cost per seat-mile (¢)	2.23	2.34	1.94	2.84
Cost per passenger-mile (¢)	3.00	4.16	4.08	4.45
Average flight length (miles)	692	310	222	234
Average speed-airborne	239	243	262	22[illegible]
Fuel consumed per hour (U.S. gal.)	370	463	513	490



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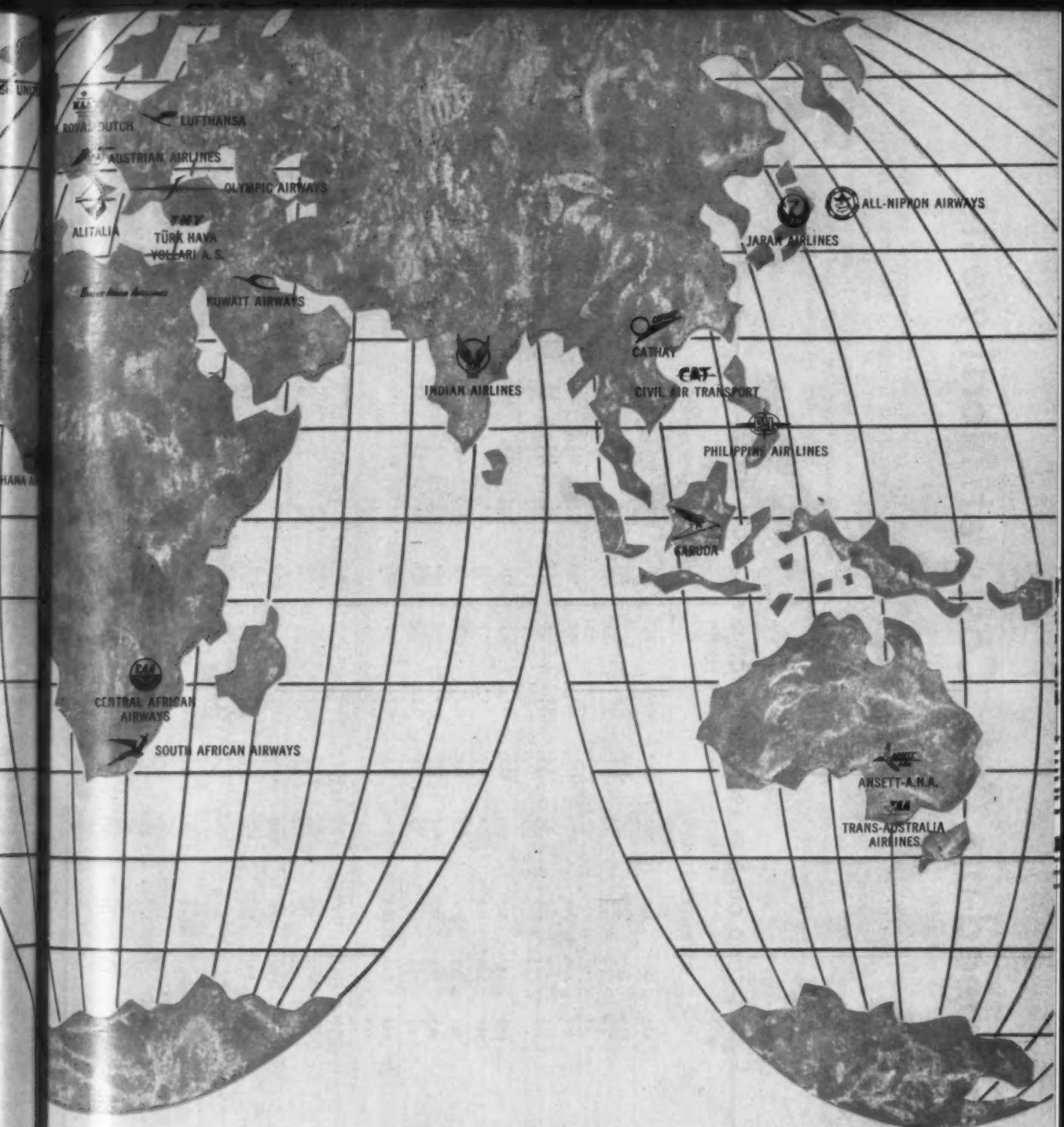
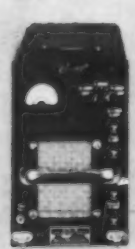


Flies with 55 Airlines

RDR-2D Transmitter/ Receiver


SYN-1B Synchronizer/ Power Supply

ANT-1G Antenna

CON-1L-4 Control Unit

PPI-1E Bright Display Indicator

THE Bendix CORPORATION

Bendix Radio Division

Electra Speed-up Cuts Costs at Northwest

The transition of the Lockheed Electra from its speed-restricted operations of 1960 to its original cruise limits tended to obscure cost trends during the second quarter of 1961. However, Northwest Airlines —presumably the first to restore full-fleet operation of modified aircraft—cut its costs from a 1960 average of $1.54 per mile to $1.27 for the second quarter.

Vickers Viscount costs showed a slight rise from 1960 averages with four carriers showing $1.12 per plane-mile. In 1960 they averaged $1.09. Seat-mile costs increased from 2.37¢ to 2.43¢. Allegheny's Convair 540 recorded costs of $1.24 for the period while seat-mile costs were 2.26¢ for the 52-passenger Convair.

In Fairchild F-27 operation, costs rose about 2% over 1960 averages as they increased from 102.8¢ in 1960 to 105¢ in the second quarter. Bonanza was low-cost operator at 93.3¢ per revenue plane-mile, a shade better than West Coast's 94.1¢.

Here's how all turboprop operators fared:

SECOND QUARTER 1961 TURBOPROP OPERATING COSTS

Costs in cents per revenue aircraft mile

	LOCKHEED ELECTRA						VISCOUNT				CV-540	FAIRCHILD F-27				
	AAL	BNF	EAL	NAL	NWA	WAL	CAP*	CAL	NEA	UAL	AAA	BAL	OZA	PAC	PAI	WCA
Crew Salaries and Expenses	37.6¢	31.3¢	40.9¢	31.0¢	28.8¢	29.0¢	27.8¢	24.0¢	23.0¢	24.3¢	26.1¢	23.0¢	22.8¢	25.1¢	25.6¢	24.9¢
Fuel, Oil and Taxes	27.1	23.6	27.4	25.1	25.6	26.9	23.3	22.6	23.0	23.8	21.7	17.1	17.1	16.8	17.7	19.5
Insurance	4.9	7.3	8.3	3.3	9.8	9.1	2.7	3.2	4.8	2.0	7.2	5.4	6.3	7.1	5.1	5.1
Other	.4	.2	...	...	.3	...	...	...	...	...	.5	...	...	1.0	...	...
Total Flying Operations	70.0	62.4	76.6	59.4	64.5	65.0	53.8	49.8	50.8	50.1	55.5	45.5	46.2	50.0	48.4	49.5
Maintenance—Labor	10.1	10.9	16.0	7.1	6.6	3.8	12.0	8.3	13.5	11.8	6.3	8.2	12.4	12.4	9.4	7.4
Maintenance—Materials	43.9	40.1	27.8	22.9	16.1	11.4	9.6	11.8	17.1	7.1	8.7	17.6	13.2	18.1	15.7	14.6
Maintenance—Reserves	...	13.9	...	10.5	...	23.8	...	3.7	(2.4)	...	19.8	2.3	12.3	5.4	12.9	5.9
Total Direct Maintenance	54.0	64.9	43.8	40.5	22.7	39.0	21.6	23.8	28.2	18.9	34.8	28.1	37.9	35.9	38.0	27.9
Maintenance—Indirect	24.1	13.8	13.8	11.8	9.2	7.1	18.2	12.7	16.4	23.7	15.1	7.2	13.4	15.7	12.0	8.2
Total Maintenance	78.1	78.7	57.6	52.3	31.9	46.1	39.8	36.5	44.6	42.6	49.9	35.3	51.3	51.6	50.0	36.1
Depreciation—Aircraft	34.2	22.6	28.7	42.1	20.7	36.9	15.3	10.9	12.6	15.0	10.6	7.6	6.4	11.7	6.8	5.1
Depreciation—Engines	.7	6.0	11.0	10.9	5.0	...	3.3	3.9	7.9	3.5	4.7	2.4	2.5	4.1	2.0	1.6
Depreciation—Parts and Other	6.5	5.6	13.5	9.9	5.4	4.4	(.4)	3.1	4.5	3.7	3.8	2.5	3.3	3.2	2.8	1.8
Total Depreciation	41.4	34.2	53.2	62.9	31.1	41.3	18.2	17.9	25.0	22.2	19.1	12.5	12.2	19.0	11.6	8.5
Aircraft and Engine Rentals	19.9	...	...	...	...	23.9	...	...	.6	...	...	...	...	...	...	...
Total Aircraft Operating Expenses	209.4¢	175.3¢	187.4¢	174.6¢	127.5¢	176.3¢	111.8¢	104.2¢	121.0¢	114.9¢	124.5¢	93.3¢	109.7¢	120.6¢	110.0¢	94.1¢
Hours Flown—Revenue	13,824	3,876	19,021	5,711	8,225	5,113	24,992	9,394	6,506	10,227	2,201	5,289	1,915	2,569	5,081	4,392
Training	148	39	261	119	677	419	187	349	299	58	73	76	10	69	36	42
Other	84	36	541	18	68	43	145	39	45	66	50	51	15	45	36	28
Total Hours Flown	14,056	3,951	19,823	5,848	8,970	5,575	25,224	9,782	6,850	10,351	2,324	5,416	1,940	2,683	5,153	4,462
Revenue Utilization	5:33	5:30	5:22	5:50	6:35	5:17	8:30	8:27	7:06	8:18	5:30	6:59	7:00	4:42	7:00	8:03
Average Fleet Size	28.7	7.7	38.9	10.7	13.7	10.6	48.0	12.5	10.1	41.0	4.4	8.0	3.0	6.0	8.0	6.0
Revenue Aircraft Miles	4,090,124	1,196,636	5,316,421	1,670,256	2,638,716	1,608,297	5,881,585	2,408,828	1,465,758	2,373,795	509,700	1,097,194	366,710	515,019	952,040	869,933
Passenger Load Factor—First Class	63.7%	62.3%	50.2%	37.1%	54.4%	49.4%	58.7%	47.3%	68.9%	61.5%	48.0%	46.3%	49.7%	60.5%	49.8%	47.1%
Passenger Load Factor—Coach	52.1	69.2	53.6	59.1	83.9	62.4	46.7	70.8	54.2	40.7	...	...	...	50.4	...	...
Revenue Passenger Miles—First Class	171,393	25,741	146,497	21,359	65,812	25,835	138,380	49,676	42,670	59,703	12,741	19,303	7,075	8,278	16,943	16,414
Revenue Passenger Miles—Coach	7,464	27,912	41,912	45,487	62,161	45,857	13,875	13,980	1,407	4,936	...	...	...	3,487	...	...
Data in (000)																
Cost Per Seat Mile	3.02¢	2.63¢	2.69¢	2.17¢	1.73¢	2.26¢	2.48¢	1.99¢	2.75¢	2.50¢	2.39¢	2.26¢	2.82¢	3.01¢	3.08¢	2.35¢
Cost Per Passenger Mile	4.78	4.00	5.28	4.36	2.63	3.96	4.33	3.94	4.03	4.22	4.98	4.89	5.68	5.28	6.18	4.99
Average Flight Length—Miles	337	281	296	342	392	348	268	210	194	254	201	124	114	117	88	110
Average Speed—Airborne MPH	295	308	279	292	320	314	236	256	225	232	231	207	191	200	187	198
Average Speed—Block MPH	251	266	239	255	290	280	204	226	191	201	194	181	163	172	155	168
Fuel Consumption—Gals. Per Hour	754	760	736	698	737	699	468	485	461	441	389	252	261	274	259	262
Oil Consumption—Gals. Per Hour	.65	...	.18	.33	.12	...	...	...	...	...	.22	.07	...	.12	.08	.06

Domestic Operations Only

Source: AIRLIFT Research from CAB Records

*Capital Data April-May Only

707 Is Low-Cost Performer in 2nd Quarter

Domestic Operations Only — Source: AIRLIFT Research from CAB Records — *Capital Data April-May Only

707 Is Low Cost Performer in 2nd Quarter

The Boeing 707, with an average direct operating cost of $1.93 per revenue plane-mile was the low-cost performer among U.S. airline jets during the second quarter of 1961. Although its "condensed" version, the 720, actually recorded an average of $1.88 per mile, the bigger 707 shaded the 720 in average cost per available seat-mile at 1.71¢ compared to 1.715¢ for the 720. The two are remarkably similar.

Generally, jet costs tended to stabilize at about average 1960 levels with the $1.93 for 707 carriers comparing with $1.94 for 1960. In DC-8 operations, costs were trimmed an average $.05 per mile declining from $2.13 in '60 to $2.08 in April-June 1961.

Although 1960 Convair 880 costs cannot be judged representative, the second quarter results for 1961 show an average of $2.05 per mile. The DC-8 available seat costs were virtually identical to the 707 whereas the 880 averaged 2.31¢.

Here are the results for all operations during the period:

SECOND QUARTER 1961 JET OPERATING COSTS AND STATISTICS

Costs in cents per revenue mile

	CONVAIR 880			DOUGLAS DC-8					BOEING 707						BOEING 720				
	DAL	NEA	TWA	DAL	EAL	NAL	NWA	UAL	AAL	BNF	CAL	TWA-131	TWA-331	WAL	AAL	BNF	CAP	UAL	WAL
Crew Salaries and Exp.	27.8¢	21.1¢	30.2¢	29.5¢	30.0¢	24.3¢	25.7¢	25.2¢	27.2¢	24.7¢	20.6¢	34.3¢	33.7¢	21.4¢	27.1¢	21.9¢	19.1¢	28.4¢	22.5¢
Fuel, Oil and Taxes	47.4	49.6	41.8	60.3	58.3	59.3	51.9	56.2	49.0	54.6	51.4	50.7	57.8	61.0	48.4	49.4	54.9	56.9	41.6
Insurance	20.1	15.3	11.8	19.0	17.3	13.0	10.0	6.4	11.7	26.0	14.9	12.9	11.7	17.7	10.6	17.6	28.3	6.6	22.7
Other	...	...	...	...	...	...	.3	...	.3	...	...	.2	.2	...	.3	...	...	.1	...
Total Flying Opns.	95.3	86.0	83.8	108.8	105.6	96.6	93.9	87.8	88.2	105.3	86.9	98.1	103.4	100.1	86.4	88.9	102.3	92.0	86.8
Maintenance Labor	16.1	11.2	10.2	18.7	16.2	11.6	7.8	10.9	16.5	9.1	8.3	9.9	17.1	4.6	8.9	4.7	.5	18.6	5.2
Maintenance Materials	28.4	7.2	20.7	40.1	25.5	26.6	30.4	14.5	17.1	31.1	19.4	17.9	29.1	21.1	9.7	6.2	...	18.0	7.6
Maintenance Reserves	(1.1)	21.4	16.9	(5.0)	...	11.4	...	...	...	10.5	.1	7.3	(12.1)	.4	...	21.7	...	...	39.1
Total Direct Maint.	43.4	39.8	47.8	53.8	41.8	49.6	38.2	25.4	33.6	50.7	27.8	35.1	34.1	26.1	18.6	32.6	.5	36.6	51.9
Maintenance—Indirect	26.2	23.2	20.4	33.6	13.9	19.7	10.9	21.9	39.4	11.5	12.7	19.8	34.2	6.7	24.1	5.8	.5	37.3	21.8
Total Maintenance	69.6	63.0	68.2	87.4	55.7	69.3	49.1	47.3	73.0	62.2	40.5	54.9	68.3	32.8	42.7	38.4	1.0	73.9	73.7
Depreciation—Aircraft	22.6	...	27.5	30.0	29.3	31.5	26.0	25.0	19.9	35.8	17.2	27.6	30.0	...	19.0	25.3	...	27.2	25.6
Depreciation—Engines	10.7	...	11.0	19.8	9.1	18.5	7.0	8.4	3.2	10.7	3.8	11.2	12.2	...	(.1)	7.6	...	9.6	6.7
Depreciation—Parts, Other	6.4	3.4	7.2	9.1	13.2	7.7	6.1	3.8	3.4	7.0	3.6	5.9	5.0	(2.6)	3.8	3.0	...	2.1	4.7
Total Depreciation	39.7	3.4	45.7	58.9	51.6	57.7	39.1	37.2	26.5	53.5	24.6	44.7	47.2		22.7	35.9	...	38.9	37.0
Aircraft and Engine Rentals	2.9	57.0	...	...	...	...	...	...	...	...	2.1	...	...	83.1	14.5	...	157.9	...	...
Total Operating Exp.	207.5¢	209.4¢	197.7¢	255.1¢	212.9¢	223.6¢	182.1¢	172.3¢	187.7¢	221.0¢	154.1¢	197.7¢	218.9¢	213.4¢	166.3¢	163.2¢	261.2¢	204.8¢	197.5¢
Hours Flown—Revenue	4,527	4,422	7,834	3,723	5,934	2,242	1,974	23,333	14,969	1,236	5,391	12,332	3,162	1,384	13,079	1,115	899	10,649	318
Training	133	50	738	157	451	110	66	722	566	222	235	459	154	16	489	88	...	431	431
Other	55	57	72	59	84	3	7	178	98	32	30	30	11	2	161	4	4	103	24
Total Hours Flown	4,715	4,529	8,644	3,939	6,469	2,355	2,047	24,233	15,633	1,490	5,656	12,821	3,327	1,402	13,729	1,207	903	11,183	733
Revenue Utilization	5:58	8:06	6:17	7:29	7:41	6:46	9:43	8:33	8:28	5:55	11:40	9:09	8:43	7:36	7:32	6:43	7:19	7:00	3:50
Average Fleet Size	8.0	6.0	13.7	6.0	8.5	3.0	2.3	30.0	19.4	2.6	5.0	14.8	7.0	2.0	19.1	1.8	1.3	16.7	.9
Revenue Aircraft Miles	2,085,103	1,975,417	3,738,074	1,587,589	1,696,585	1,059,331	915,320	10,855,364	7,210,800	571,814	2,544,019	5,766,030	1,565,861	587,935	6,193,228	496,973	390,417	4,673,321	144,251
Pass. Load Factor 1st Cl.	58.0%	36.9%	58.3%	67.7%	57.9%	55.6%	50.7%	55.6%	58.1%	55.8%	40.4%	46.0%	44.7%	46.4%	64.0%	53.5%	43.5%	59.2%	47.1%
Pass. Load Factor Coach	68.6	53.7	80.1	77.4	62.7	64.5	57.7	66.1	63.7	72.9	45.7	56.8	52.6	66.1	73.2	70.6	42.9	76.8	69.7
Revenue Pass. Miles 1st Cl.	101,520	16,180	90,381	40,025	42,817	12,741	17,762	240,682	170,973	15,978	34,532	97,750	29,457	11,473	146,647	13,319	5,544	121,555	2,722
Revenue Pass. Coach	14,738	79,103	137,601	101,311	50,862	68,474	41,093	548,533	359,068	23,387	94,753	277,688	69,099	27,614	302,160	19,654	11,835	214,188	7,447
Cost Per Seat Mile	2.50¢	2.16¢	2.26¢	2.15¢	1.82¢	1.84¢	1.56¢	1.50¢	1.58¢	2.08¢	1.33¢	1.63¢	1.74¢	1.89¢	1.61¢	1.54¢	2.54¢	1.98¢	1.73¢
Cost Per Pass. Mile	3.72	4.34	3.24	2.89	2.96	2.92	2.83	2.40	2.55	3.21	3.03	3.04	3.48	3.21	2.30	2.46	5.87	2.87	2.80
Av. Flt. Length—Miles	677	811	842	796	829	1,024	1,309	1,115	1,561	672	1,060	1,252	1,505	628	1,020	603	695	619	561
Av. Speed—Airborne MPH.	460	446	477	426	454	472	463	465	482	462	486	467	495	424	474	445	434	458	453
Av. Speed—Block MPH.	398	388	418	372	406	420	413	422	445	410	458	430	453	382	422	392	374	397	416
Fuel Con.—Gals. Per Hour	2,110	1,972	2,267	2,341	2,522	2,696	2,463	2,396	2,255	2,641	2,145	2,256	2,723	2,341	2,174	2,349	2,052	2,235	1,986
Oil Con.—Gals. Per Hour	...	.09	.15	...	.23	.58	.46	.29	.55	...	...	.42	.41	...	.32	...	.15	.26	...

Source: AIRLIFT Research From CAB Records

U.S. Airline Revenues and Expenses

2nd Quarter 1961 vs. 1960

This complete summary compiled by AIRLIFT magazine from Official CAB Records

	Total Operating Revenues			Passenger Revenues			Total Operating Expenses			Net Operating Income		
	1961	1960	% Change	1961	1960	% Change	1961	1960	% Change	1961	1960	% Change
DOMESTIC												
American	$109,234,022	$107,932,094	1.21	$ 97,683,559	$ 97,387,543	0.30	$ 99,255,393	$ 99,443,347	—0.19	$ 9,978,629	$ 8,488,747	17.55
Braniff	19,579,073	19,804,287	—1.14	17,880,230	18,196,848	—1.74	18,781,662	18,569,737	1.14	797,411	1,234,550	—35.41
Capital	17,335,477	28,559,606	....	16,009,724	26,785,694	....	18,148,550	28,702,651	....	—813,073	—143,045	....
Continental	15,794,819	15,188,830	4.00	14,641,863	14,192,713	3.16	14,454,848	13,381,748	8.02	1,339,971	1,807,082	—25.85
Delta	39,785,574	33,445,123	18.96	36,873,132	30,644,155	20.32	35,270,085	28,794,864	22.49	4,515,489	4,650,259	—2.90
Eastern	68,044,664	61,632,889	10.40	62,949,412	57,215,357	10.02	71,527,163	66,815,930	7.05	—3,482,499	—5,183,041	....
National	15,744,580	17,368,840	—9.35	14,059,956	16,136,811	—12.87	16,502,426	18,465,430	—10.63	—757,846	—1,096,590	....
Northeast	13,939,763	9,997,065	39.44	13,126,254	9,340,160	40.53	14,815,023	10,232,803	44.78	—875,260	—235,738	....
Northwest	20,410,193	21,917,203	—6.88	18,422,312	19,559,307	—5.81	18,638,631	21,253,594	—12.30	1,771,562	663,609	166.96
Trans World	72,697,105	71,162,700	2.16	65,582,609	65,179,446	0.62	73,149,899	70,198,319	4.20	—452,794	964,381	....
United	118,357,462	89,285,514	....	105,286,893	78,583,809	....	109,814,098	84,221,000	....	8,543,364	5,064,514	....
Western	13,837,626	15,257,375	—9.31	12,843,816	14,142,472	—9.18	13,494,428	14,440,101	—6.55	343,198	817,274	—58.01
Totals	$524,760,358	$491,551,526	6.8	$475,359,760	$447,364,315	6.3	$503,852,206	$474,519,524	6.2	$20,908,152	$ 17,032,002	22.8

Capital figures reflect April-May 1961 versus April-June 1960. United 1961 figures include June Capital results.

INTERNATIONAL												
American	$ 1,517,788	$ 1,652,437	—8.15	$ 1,228,761	$ 1,401,397	—12.32	$ 1,657,961	$ 1,742,585	—4.86	—140,173	—90,148	....
Braniff	2,753,748	2,775,883	—0.80	2,327,042	2,377,139	—2.11	3,426,442	2,812,493	21.83	—672,694	—36,610	....
Caribair	953,784	852,256	11.91	876,031	779,995	12.31	880,597	776,182	13.45	73,187	76,074	—3.80
Delta	426,794	988,975	—56.84	395,443	907,427	—56.42	699,289	1,114,772	—37.27	—272,495	—125,797	....
Eastern, Overseas	8,618,920	7,016,566	22.84	7,944,805	6,505,436	22.12	8,534,866	6,279,565	35.91	84,054	737,001	—88.59
San Juan	5,739,405	5,174,608	10.91	5,185,319	4,766,606	8.78	6,383,093	4,411,838	44.68	—643,688	762,770	....
Bermuda	770,025	727,129	5.90	726,991	680,027	6.91	574,731	507,463	13.26	195,294	219,666	—11.10
Mexico	2,109,490	1,114,829	89.22	2,032,495	1,058,803	91.96	1,577,042	1,360,264	15.94	532,448	—245,435	....
Mackey	530,879	511,721	3.74	497,188	463,921	7.17	494,026	503,338	—1.85	36,853	8,383	339.62
National	....	354,477	....	....	301,637	....	....	523,922	....	....	—169,445	....
Northwest	10,653,798	9,543,421	11.63	7,041,822	6,131,704	14.84	7,831,864	9,213,061	—14.99	2,821,934	330,360	754.28
Panagra	5,320,578	4,481,696	18.72	3,788,828	3,245,155	16.75	5,593,648	5,126,295	9.11	—273,070	—644,599	....
Pan American, System	117,391,311	105,682,230	11.08	88,789,711	84,544,657	5.02	105,875,186	95,138,749	11.28	11,516,125	10,543,481	9.22
Non-divisional	—37	....	....	....	....	....	20,157	5,100	295.24	—20,194	—5,100	....
Latin American	25,801,963	24,843,727	3.86	19,914,083	18,837,220	5.71	26,461,467	27,846,945	—4.98	—659,504	—3,003,218	....
Atlantic	55,200,932	49,323,090	11.92	43,360,840	40,829,297	6.20	50,489,503	41,955,374	20.34	4,711,429	7,367,716	—36.05
Pacific	35,033,688	29,936,211	17.03	24,362,994	23,565,087	3.38	27,481,776	23,817,308	15.39	7,551,912	6,118,903	23.42
Alaska	1,354,765	1,579,202	—14.21	1,151,794	1,313,053	—12.28	1,422,283	1,514,022	—6.06	—67,518	65,180	....
Trans Caribbean	1,727,181	1,826,942	—5.5	1,186,357	1,493,886	—20.6	1,967,687	1,531,059	28.5	—240,506	295,883	....
Trans World	22,688,765	29,953,078	—24.25	17,596,950	24,736,998	—28.86	22,673,037	21,390,735	5.99	15,728	8,562,343	99.82
United	6,644,166	5,868,241	13.22	6,087,292	5,535,620	9.97	4,660,754	3,953,829	17.88	1,983,412	1,914,412	3.60
Western	1,058,904	1,235,803	—14.31	1,004,370	1,171,343	—14.25	1,162,420	1,087,298	6.91	—103,516	148,505	....
Totals	$180,286,616	$172,743,726	4.4	$138,764,600	$139,596,315	—0.60	$165,457,777	$151,193,883	9.4	$ 14,828,839	$ 21,549,843	31.2
LOCAL SERVICE												
Allegheny	$ 5,399,434	$ 3,653,082	47.80	$ 3,517,235	$ 2,604,255	35.06	$ 5,079,058	$ 3,778,907	34.41	$ 320,376	$ —125,825	....
Bonanza	2,268,613	1,751,886	29.49	1,370,515	1,096,270	25.02	2,008,832	1,865,945	7.66	259,781	—114,059	....
Central	2,161,700	1,379,852	56.66	931,523	627,883	48.36	1,980,848	1,432,271	38.30	180,852	—52,419	....
Frontier	3,693,503	3,673,518	0.54	1,765,439	1,552,104	13.74	3,513,020	3,337,766	5.25	180,483	335,752	—46.24
Lake Central	2,654,081	1,242,015	113.69	1,498,274	751,829	99.28	2,546,078	1,203,282	111.59	108,003	38,733	178.84
Mohawk	4,506,685	2,979,098	51.28	3,135,835	2,318,551	35.25	3,972,568	3,120,514	27.26	534,117	—141,416	....
North Central	6,366,768	5,775,478	10.24	3,980,843	3,268,273	21.80	6,075,508	5,302,851	14.57	291,260	472,627	—38.37
Ozark	3,374,281	3,492,475	—3.38	2,140,694	1,992,847	7.42	3,147,593	3,158,898	—0.36	226,688	333,577	—32.04
Pacific	2,890,079	2,485,469	16.28	1,628,222	1,620,203	0.49	2,592,866	2,974,943	—12.84	297,213	—489,474	....
Piedmont	3,676,392	3,114,156	18.05	2,310,580	1,953,442	18.28	3,305,506	3,066,031	7.81	370,886	48,125	670.66
Southern	2,664,435	1,473,928	80.77	1,466,521	880,203	66.61	2,398,606	1,774,147	35.19	265,829	—300,219	....
Trans-Texas	2,580,340	2,234,517	15.47	1,404,835	1,352,560	3.86	2,553,768	2,197,785	16.20	26,572	36,732	—27.66
West Coast	3,054,477	2,583,248	18.24	1,675,063	1,569,844	6.70	2,681,282	2,840,957	—5.62	373,195	—257,709	....
Totals	$ 45,290,788	$ 35,838,722	26.38	$ 26,825,579	$ 21,588,264	24.26	$ 41,855,533	$ 36,054,297	16.09	$ 3,435,255	$ —215,573	....
HELICOPTERS												
Chicago	$ 788,662	$ 997,126	—20.91	$ 387,017	$ 528,612	—2.68	$ 842,221	$ 830,539	1.41	$ —53,559	$ 166,587	....
Los Angeles	417,809	379,990	9.95	71,785	62,429	14.99	410,591	352,453	16.49	7,218	27,537	—73.79
New York	921,600	874,021	5.44	293,187	288,468	1.64	1,029,923	909,185	13.28	—108,323	—35,164	....
Totals	$ 2,128,071	$ 2,251,137	—5.47	$ 751,989	$ 879,509	—14.50	$ 2,282,735	$ 2,092,177	9.11	$ —154,664	$ 158,960	....
INTRA HAWAII												
Aloha	$ 1,348,504	$ 1,246,413	8.18	$ 1,157,005	$ 1,181,146	—2.04	$ 1,345,119	$ 1,261,015	6.67	$ 3,385	$ —14,602	....
Hawaiian	2,024,381	2,829,268	—28.45	1,629,126	1,629,195	....	1,967,451	2,717,463	—27.60	56,930	111,805	—49.08
Totals	$ 3,372,885	$ 4,075,681	—17.24	$ 2,786,131	$ 2,810,341	—0.86	$ 3,312,570	$ 3,978,478	—16.74	$ 60,315	$ 97,203	—37.95
ALASKA												
Alaska	$ 2,261,501	$ 2,056,030	9.99	$ 642,929	$ 629,534	2.13	$ 2,137,006	$ 2,015,588	6.02	$ 124,495	$ 40,442	207.84
Alaska Coastal	546,128	539,702	1.19	277,488	301,192	—7.87	534,452	573,716	—6.84	11,676	—34,014	....
Cordova	331,564	317,526	4.42	62,230	43,312	43.68	353,384	308,944	14.38	—21,820	8,582	....
Ellis	345,856	362,325	—4.55	192,251	218,025	—11.82	333,122	329,105	1.22	12,734	33,220	—61.67
Nor. Consolidated	1,629,206	769,186	111.81	344,389	246,182	39.89	898,714	767,588	17.08	730,492	1,598	100+
Pacific Northern	3,232,802	3,012,035	7.33	2,113,272	1,944,705	8.67	2,960,164	2,809,597	5.36	272,638	202,438	34.68
Reeve	837,742	749,284	11.81	449,173	444,604	1.03	587,987	584,111	0.66	249,755	165,173	51.21
Wien	2,128,374	1,586,518	34.15	327,314	305,122	7.27	1,181,709	1,255,916	—5.91	946,665	330,602	186.35
Totals	$ 11,313,173	$ 9,392,606	20.44	$ 4,409,046	$ 4,132,676	6.69	$ 8,986,538	$ 8,644,565	3.96	$ 2,326,635	$ 748,041	211.03

CARGO	Cargo Revenues			Charter Revenues			Total Operating Revenues			Total Operating Expenses			Operating Profit or Loss		
	1961	1960	% Change	1961	1960	% Change	1961	1960	% Change	1961	1960	% Change	1961	1960	% Change
AAXICO	....	....	....	....	$ 2,788,702	....	$ 92,833	$ 2,854,738	—96.75	$ 100,472	$ 2,170,685	—95.37	$ —7,639	$ 684,053	....
Flying Tiger	$2,652,578	$3,318,310	—20.06	$4,775,808	2,787,036	71.35	7,528,507	6,468,433	16.39	7,190,601	6,896,822	4.26	—337,906	—428,389	....
Riddle	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Slick	....	....	....	2,304,175	3,871,073	—40.48	2,343,546	3,941,439	—40.54	1,991,705	3,639,480	—45.28	351,841	301,959	16.25
Aerovias Sud	111,399	303,424	—63.3	590,419	458,460	28.78	714,865	761,859	—6.17	718,842	727,654	—1.21	—3,977	34,205	....
Seaboard World	3,328,195	2,376,185	40.06	1,452,743	1,369,951	6.04	4,778,801	3,726,874	28.22	5,791,129	5,622,570	3.00	—1,012,328	—1,895,696	....
Totals	$6,092,172	$5,997,919	1.57	$9,123,145	$11,275,222	—19.09	$15,458,552	$17,753,343	—12.93	$15,792,749	$19,057,211	—17.13	$—334,197	$—1,303,868	....

BRITISH
AIRCRAFT
CORPORATION

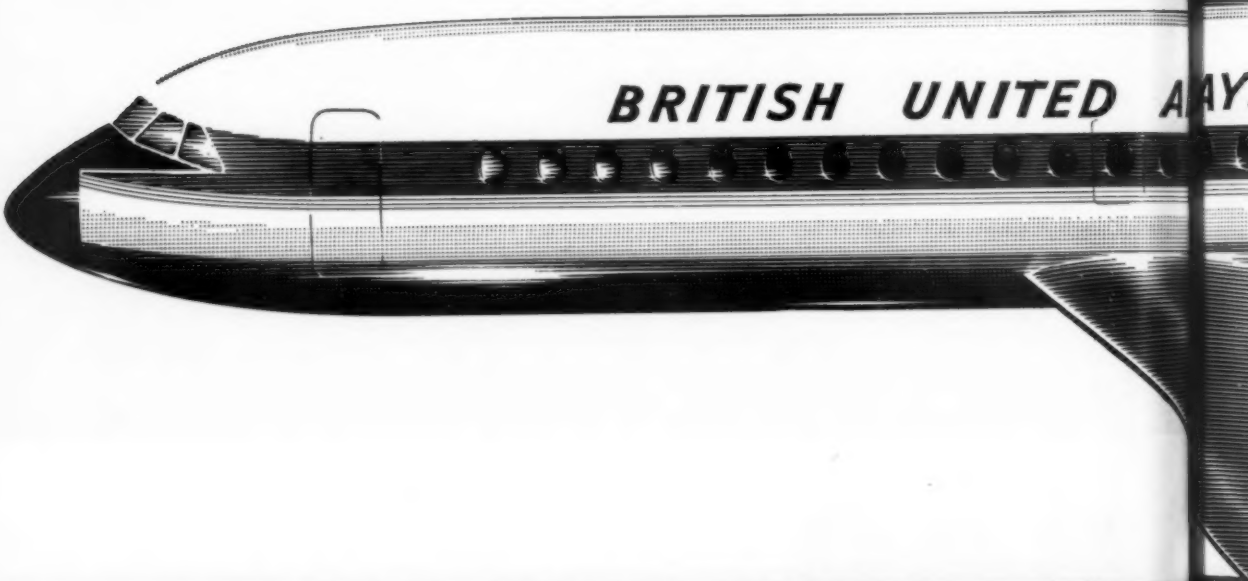
announces

BAC
ONE-ELEVEN

THE SHORT HAUL JET

JET SUCCESSOR TO THE VISCOUNT

BRITISH UNITED
CHOOSES
THE SHORT HAUL JE



JET SUCCESSOR TO THE VISCOUNT

WITH EVEN BETTER THAN VISCOUNT ECONOMICS

AIRWAYS

BAC ONE-ELEVEN

TWO ROLLS-ROYCE SPEY TURBOFAN ENGINES

..and built by

BRITISH AIRCRAFT CORPORATION

BAC
ONE-ELEVEN

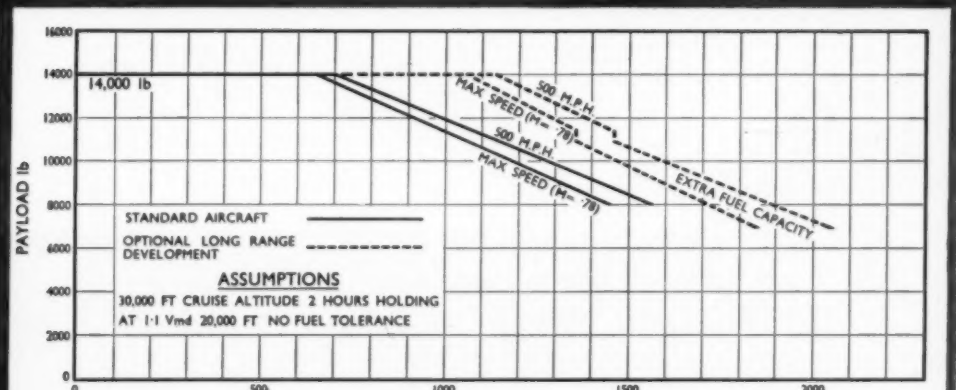
THE SHORT HAUL JET

- 540 m.p.h. cruise speed
- 57 mixed class or 69 tourist passengers
- Short airfield performance
- Quick turn-round: built-in auxiliary power unit
- Cabin width for spacious five-abreast seating
- Range of over 1,100 miles with full 14,000 lb payload

BRITISH UNITED AIRWAYS HAS CHOSEN THE OPTIONAL LONG RANGE DEVELOPMENT OF THE STANDARD AIRCRAFT

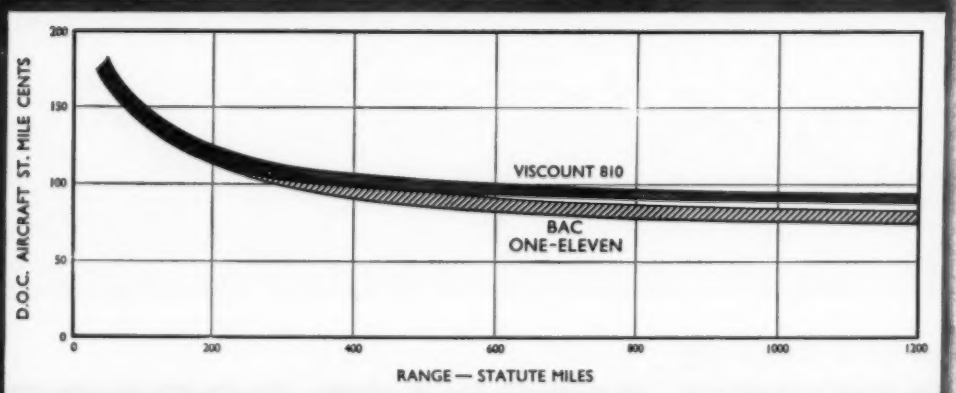
PAYLOAD v. RANGE

The BAC One-Eleven can carry its full complement of 57 mixed class passengers and baggage at 500 mph for stages of 1,070 statute miles with two hours reserves. It can carry 43 passengers for 1,500 miles



ECONOMICS

These bands cover seven separate methods of costing — ATA (1955), ATA (1960), SBAC and those of four airlines



BRITISH AIRCRAFT CORPORATION

ONE HUNDRED PALL MALL LONDON SW1 ENGLAND

U.S. Airline Traffic – Jan. / August 1961 vs. 1960

This complete summary compiled by AIRLIFT Magazine from official CAB data

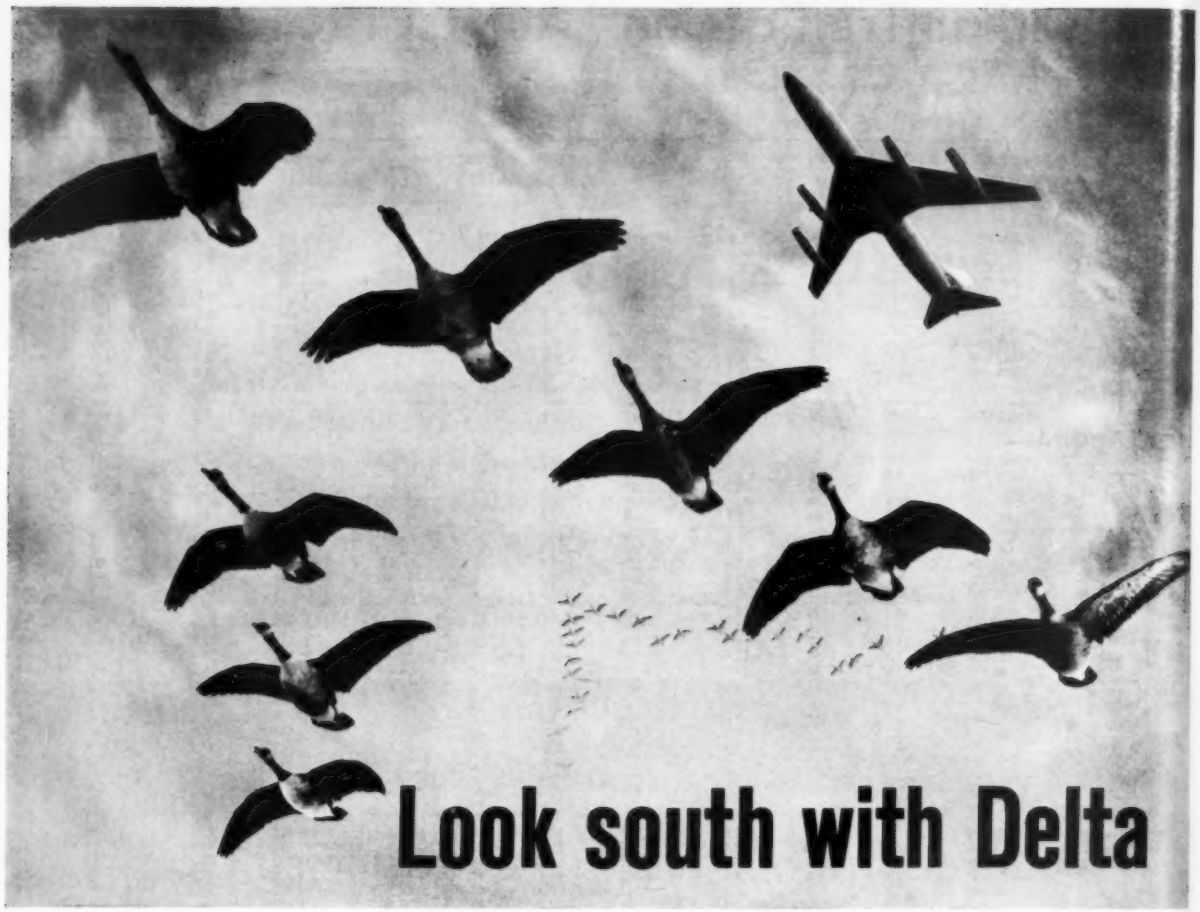
	1961 to Date				July				August			
	Rev. Pass. Miles (000)		Rev. Pass. (000)		Rev. Pass. Miles (000)		Rev. Pass.		Rev. Pass. Miles (000)		Rev. Pass.	
	1961	% Chge	1961	% Chge	1961	% Chge	1961	% Chge	1961	% Chge	1961	% Chge
DOMESTIC												
United[2]	5,088,899	12.7	7,779	5.6	678,997	4.2	994	0.1	705,195	4.4	1,046	— 0.3
American	3,901,442	— 8.3	4,945	—10.3	517,443	—12.1	618	—11.2	558,652	— 6.9	688	— 5.5
Trans World	2,820,335	— 8.1	3,079	— 8.7	402,986	—10.0	401	— 7.8	438,289	— 3.4	440	— 1.1
Eastern	2,698,923	— 3.3	5,122	— 1.2	341,324	— 0.5	648	2.2	337,023	— 1.7	674	3.1
Delta	1,460,773	19.2	2,456	10.3	175,048	21.3	281	4.5	179,265	20.5	295	5.7
National	725,388	— 3.0	1,079	— 4.6	115,456	43.3	151	16.2	113,449	55.5	156	25.8
Braniff	696,343	— 2.4	1,480	— 1.3	84,474	— 7.6	173	— 5.5	92,835	0.1	193	2.1
Northwest	627,494	—34.1	862	—32.5	111,637	— 8.2	149	— 6.9	123,704	— 4.0	168	— 1.8
Continental	603,440	— 0.8	893	— 0.8	82,717	— 8.4	114	— 5.8	82,920	— 7.9	115	—11.5
Western	529,906	—19.8	883	—23.7	88,800	— 4.4	142	— 7.2	100,447	8.9	165	8.6
Northeast[1]	NA	...	NA	...	68,235	41.5	154	16.7	NA	..	NA	...
	19,152,943	— 1.9	28,578	— 3.5	2,667,117	— 1.2	3,825	— 2.1	2,731,779	1.3	3,940	0.5
INTERNATIONAL												
PAA System	4,029,036	18.9	2,320	8.5	718,347	35.0	392	18.1	693,371	32.6	391	14.7
Latin America	1,048,293	4.0	815	— 2.5	189,299	26.5	140	16.7	179,341	27.4	135	17.4
Atlantic	1,637,852	19.3	1,128	15.2	336,379	38.8	196	18.8	307,406	29.3	196	9.5
Pacific	1,295,016	34.9	333	20.7	183,989	39.6	48	23.1	197,078	45.5	51	34.2
Alaska	47,875	— 2.5	44	— 8.3	8,680	2.6	8	...	9,544	4.6	9	...
Trans World	622,383	—20.5	200	—22.5	120,872	—24.2	36	—28.0	118,550	—13.4	36	—16.3
Eastern Overseas	542,412	10.9	362	8.1	83,314	— 7.7	57	— 8.1	69,169	— 7.9	48	— 7.7
San Juan	423,004	1.6	278	2.6	65,262	—17.5	43	—17.3	52,367	—19.7	35	—16.7
Bermuda	23,452	— 5.6	28	—12.5	5,069	0.3	6	...	3,929	— 8.8	5	—16.7
Mexico	95,956	100.9	56	75.0	12,983	112.9	8	100.0	12,873	131.4	8	100.0
United	319,931	18.1	128	18.5	58,637	6.4	24	9.1	63,058	3.5	25	4.2
Northwest	243,227	0.1	126	— 2.3	43,140	19.9	24	26.3	45,737	18.4	25	56.3
Panagra	145,496	13.9	82	— 1.2	20,764	14.1	11	...	20,523	22.9	12	20.0
Trans Caribbean	131,082	—12.2	85	—12.4	26,463	— 3.8	17	— 5.6	18,030	—34.4	11	—38.9
Braniff	97,279	15.5	66	61.0	13,275	— 4.5	10	66.6	13,671	6.5	10	66.7
American	61,770	—26.0	57	—28.8	8,851	—18.2	8	—20.0	8,960	—14.0	8	—20.0
Western	47,301	—17.3	31	18.4	8,777	35.2	6	50.0	9,384	48.6	6	50.0
Caribair	20,984	9.1	297	8.4	2,895	4.5	41	5.1	2,896	7.6	41	7.9
Mackey	16,404	—15.9	94	— 2.1	2,182	—23.1	13	8.3	2,294	—35.9	11	— 8.3
Delta	15,703	—45.9	11	—47.6	2,497	—38.3	2	—33.3	2,271	—36.2	2	—33.3
National	1,497	—91.4	3	—86.4	...	...	...	...	579	—75.1	1	—66.7
	6,294,505	9.2	3,862	3.8	1,110,014	15.3	641	8.3	1,068,493	16.1	627	8.1
LOCAL SERVICE												
North Central	128,364	11.4	690	6.5	18,402	13.2	95	8.0	19,927	15.7	103	9.6
Allegheny	112,325	38.0	540	27.7	14,985	22.1	72	16.1	17,074	29.6	82	22.4
Mohawk	97,609	31.0	471	26.9	12,513	16.1	58	11.5	13,935	20.6	65	16.1
Pacific	71,495	— 7.9	306	— 9.5	8,187	—22.8	37	—19.6	9,129	—17.7	40	—16.7
Piedmont	68,899	6.7	323	8.0	9,610	7.5	44	7.3	10,442	10.2	49	8.9
Ozark	67,267	3.2	376	2.2	8,127	— 4.7	45	— 4.3	9,037	0.1	51	...
Frontier	65,804	10.6	241	7.1	8,511	2.7	31	...	9,456	6.3	34	3.0
West Coast	63,299	— 0.9	255	— 5.2	8,160	— 9.9	33	—10.8	8,713	— 3.6	36	— 5.3
Bonanza	51,816	17.9	206	17.0	6,362	14.7	26	18.2	6,772	19.0	27	17.4
Trans Texas	48,729	1.0	210	1.4	6,060	0.4	26	...	6,684	9.0	29	11.5
Southern	46,317	66.0	256	65.2	5,894	318.0	33	312.5	6,555	140.3	37	146.7
Lake Central	40,919	68.3	256	66.2	5,611	86.7	35	94.4	6,518	116.4	41	115.8
Central	28,467	29.7	148	29.8	4,052	36.0	22	37.5	4,560	47.8	24	50.0
	891,310	16.0	4,278	14.2	116,474	12.4	557	49.4	128,802	16.9	618	16.4
HELICOPTERS												
Chicago	2,900	—17.7	170	—18.7	353	—28.3	20	—31.0	408	— 1.9	23	— 8.0
New York	1,946	— 1.7	98	— 1.0	226	—22.1	13	—13.3	261	0.4	14	7.7
Los Angeles	1,132	15.2	32	18.5	163	7.9	5	...	178	10.6	5	...
	5,978	— 7.8	300	—10.4	742	—20.5	38	—22.4	847	1.2	42	— 2.3
INTRA HAWAII												
Hawaiian	51,981	—33.7	334	— 8.0	8,871	—39.0	56	— 3.4	9,939	—16.3	66	10.0
Aloha	37,683	— 2.4	251	— 0.8	6,871	4.9	42	...	7,143	3.2	48	4.3
	89,664	—23.4	585	— 5.0	15,742	—25.4	98	— 2.0	17,082	— 9.1	114	7.5
ALASKA												
Pacific Northern	88,235	11.4	92	12.2	14,403	2.1	15	7.1	16,696	3.8	17	6.3
Alaska	58,716	—18.7	63	—25.0	3,970	—57.7	5	—54.5	5,029	—54.2	6	—53.8
Wien	10,758	5.1	34	3.0	2,792	9.0	8	14.3	2,946	18.0	8	...
Reeve	10,438	1.0	12	...	1,484	12.6	2	100.0	1,863	1.6	2	...
Northern Consol.	7,540	9.5	23	4.5	1,580	14.2	5	25.0	1,454	2.8	4	...
Alaska Coastal	4,176	— 2.9	43	...	721	— 2.0	8	...	816	— 4.2	9	...
Cordova	2,748	9.0	17	30.8	648	33.3	4	100.0	429	16.6	3	50.0
Ellis	2,484	— 6.8	39	—11.4	418	— 5.2	7	—12.5	448	— 3.9	7	—12.5
	185,095	— 1.7	323	— 3.0	26,016	—14.5	54	— 1.8	29,681	—13.9	56	— 9.7

ALL CARGO
(Ton miles in thousands)

	July Freight		July—Total Scheduled		July—All Services		August Freight		August—Total Scheduled		August—All Services	
	1961	% Change	1961	% Change	1961	% Change	1961	% Change	1961	% Change	1961	% Change
Flying Tiger	5,103,728	—11.9	5,136,540	—12.4	12,499,895	39.2	5,340,532	—16.5	5,382,614	—17.0	14,413,243	50.5
Riddle	1,365,658	5.7	1,407,493	4.9	10,495,351	211.3	1,455,943	5.5	1,529,822	6.7	11,804,122	233.8
Slick	.....	....	.....	....	6,416,178	70.0	.....	....	.....	....	6,251,031	93.5
Aerovias Sud	145,663	—68.8	145,663	—68.8	238,616	—58.3	154,504	—63.7	154,504	—63.7	204,286	—53.6
Seaboard World	2,496,824	12.2	3,319,008	10.7	8,318,531	53.1	2,863,609	26.1	3,813,270	18.8	9,171,818	70.9
	9,111,873	— 6.8	10,008,704	— 6.2	37,968,571	71.5	9,814,588	— 6.3	10,880,210	— 5.8	41,844,500	88.9

Aaxico not available

[1] Northeast's August statistics not available. Year to Date reflects Jan.-July.
[2] United statistics for 1960 include those of Capital for comparative purposes. 1960 Capital figures Jan.-July are 900,349,000 passenger miles, 2,129,000 passengers; Jan.-Aug. are 1,028,495,000 passenger miles, 2,442,000 passengers; July 125,764,000 passenger miles, 302,000 passengers; Aug. 128,146,000 passenger miles, 313,000 passengers.



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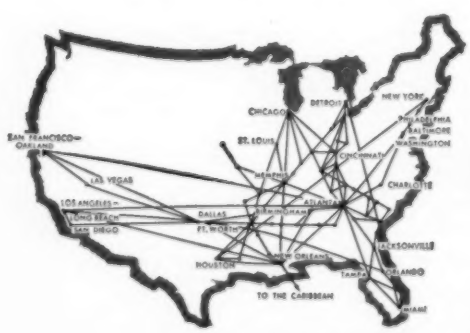

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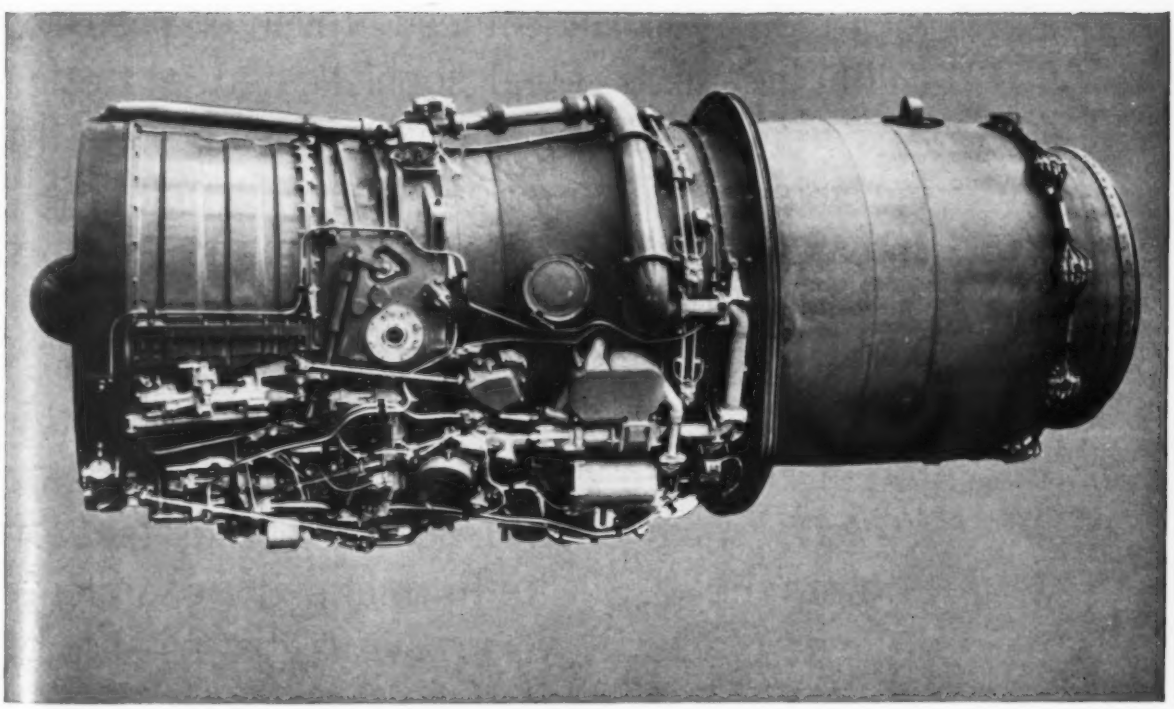

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The JT8D utilizes the same design philosophy and basic technology of the jet engines which have more than 15 million hours of performance and reliability to their credit. Also from these proven engines, the JT8D inherits a sound, sophisticated jet design. And from the JT3D turbofan, which powers the fan versions of the Boeing and Douglas jets, comes the essential design for the fan structure of the JT8D.

American Airlines, Eastern Air Lines, Lufthansa and United Air Lines have all ordered this latest turbofan engine for their new Boeing 727s. Turning out 14,000 pounds of take-off thrust, the JT8D helps make it possible to operate efficiently from runways that used to be too short for modern jet travel. Now additional cities coast-to-coast will be connected to the rest of the world by jet.

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TECHNICALLY SPEAKING

By Joe Murphy

Those odd customs . . . Needed: ramp courtesy . . . And what to do about hydraulics

Odd customs—We hope the U.S. customs people enjoyed the technical slides on French supersonic engine developments they confiscated from one of the speakers at the recent West Coast meeting of the Society of Experimental Test Pilots. They certainly through a needless monkey wrench into an otherwise good program and added another niche to their record of near-sighted customs management. Maybe someday someone will wake up.

Airport manners—After having been blasted up the front passenger ramp on an Air France Caravelle by the exhaust of a Boeing 707 (El Al 4XATB, Orly on Sept. 10) we're inclined in favor of some self-enforced ramp traffic rules on the part of airlines. It's quite a hair-raising experience, to put it mildly.

Hydraulic-powered furore—With all the fuss and publicity being given to jet emergencies involving hydraulic failures, it's about time somebody backed off and took a look at what's been happening in this area of system development and then mapping a course that will get results.

A big jet today involves about ½ mile of hydraulic plumbing which strings together some 275 components. This is not just a system, it's virtually a flying hydraulic-powered factory. The airlines are going to have to begin looking at it as such. Only a few have done so from the start and the results show in their operating record.

It used to be that hydraulics on most aircraft were takeoff/landing systems with pumps idly by-passing in cruise. Not so with jets. Of the 20 different chores handled by jet hydraulics, a good dozen of them involve routine flight. But little has been done in hydraulic system design to match this vastly increased demand for improved reliability. The normal design advances characteristic of the jet transition were there but this falls far short of the need.

Certainly the reliability of jet hydraulics is improving, but unless the FAA, manufacturers and airlines get together and set some goals (instead of tackling small problems) it's going to be a long, long time getting where it should be.

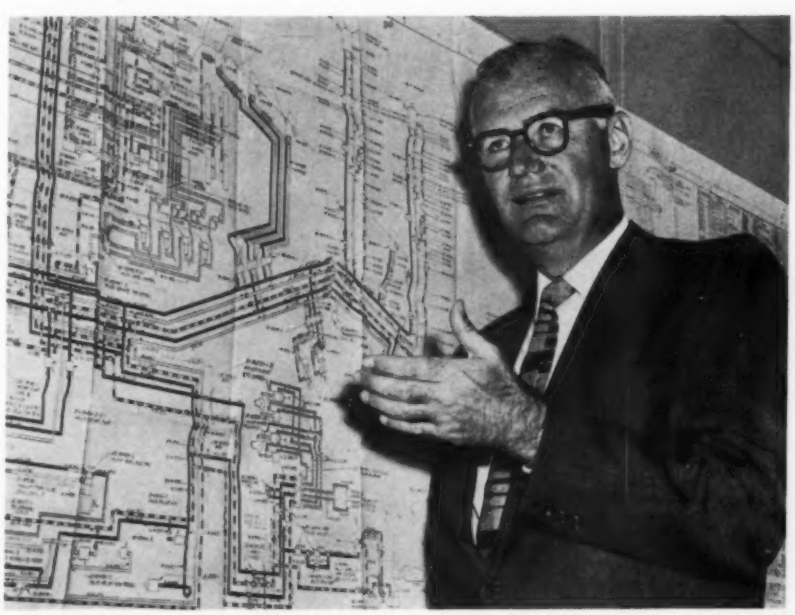
The "scatter" of types of problems alone suggests that airlines train special crews to keep these "boiler rooms" in operation. Look at the record of premature removal rates per 1000 hours for one airline alone between Jan. 1960 and May 1961:

Justifiable Removals
(per 1000 operating hours)

Item	1/1/60 to 12/31/60	1/1/61 to 5/31/61
Performance improving		
Engine driven pumps	.147	.069
Aux. Motorpump	.369	.267
Spoiler valve	.074	...
Brake valves	.037	...
Actuators	.030	.009
L/G valves	.295	.276
L/G-brakes, tires	.147	.138
System relief valve	.025	...
Performance declining		
Hydraulic lines	.516	.379
Fittings	.369	.552
Filters	.055	.138
Rudder valve	.074	.276
Pressure regulator	.074	.138
Stab. trim motor	...	.138

More freedom for jets—After three full years of jet airline operations, the U.S. Federal Aviation Agency has given the green light to reduce operating minimums to 200 ft. and ¼ mile, but only under rigidly prescribed qualifications of the crew, the aircraft and the airport. These are routine piston allowables compared to the 300 ft. and ¾ miles under which jets have operated.

To qualify, the aircraft must be fitted with a flight director and a coupler if an airline bases his bid for lower minimums on coupler use. The runway must be fitted with ILS (or precision approach radar) and high-intensity approach lights. The pilots must have 300 hrs. on the aircraft; the crosswind cannot exceed 15 knots; and, an additional 1000 ft. of runway or 15% of the required landing distance must be available. The aircraft must have an improved instrument failure warning system in lieu of which the carrier must demonstrate it has a procedure to readily detect flight instrument failures. ■



HYDRAULIC COMPLEXITY of a jet is evident in diagram shown with B. W. Badenoch, v.p. and gen. mgr. of Vickers, Inc., builders of jet hydraulic pumps.

Airports Face Revolution in Parking

New concepts in garages, roadways, pedestrian control, finance challenge 'airport-city' planners

By LEIGH FISHER

Chicago and San Francisco are currently studying airport parking structures—with capacities up to 10,000 cars.

But the world's largest commercially-operated garage is the Grant Park Garage in Chicago (owned by the Chicago Park District). This garage has a capacity of 2359 cars on two underground levels, with a floor area of 850,000 square feet.

Admittedly, there are larger auto parking areas elsewhere, but they are not operated on a fee based on time, with the turn-over problem that plagues the downtown and airport garage operators. Ball parks and stadiums, with their all-in and all-out operation, pose different problems.

The Pershing Square parking garage in Los Angeles is reported to be the second largest commercial garage in the world, with a capacity of some 2,000 cars on its three underground storage levels, with a total area of 630,000 square feet. Union Square Garage at San Francisco can accommodate some 1,700 cars on its seven levels.

These, the three largest reported parking structures in the world for a "turn-over" type of operation, are all underground, and their current costs are estimated at from $3500 to $6000 per car, compared to $1,000 to $1,600 per car estimated for above-ground storage garages.

Above-ground parking structures obviously are more desirable from a cost viewpoint, even if they do present some aesthetic problems. Probably the world's largest above-ground garage is that adjoining the Hecht Company's suburban shopping center outside Washington, D.C., with 1,600 stalls in its 640,000 square feet.

Surface traffic mushrooms

But size also brings problems, as airport planners find as they delve deeper into developing garages to serve the mushrooming airport surface traffic. The dilemma of how to build these parking garages in the shrinking space left in the terminal areas, tying them into the access roadways, baggage claim areas, rent-a-car parks, taxi lines, and airport coach services is proving a formidable task. If not properly designed, these garages could turn out to be a bottleneck of rigid steel, stone and mortar, clogging the airport's arterial roads with traffic jams.

Chicago's new O'Hare Airport in July, 1960, had a planned parking capacity of some 8000 cars in its terminal complex—5400 on grade and 2600 on a contemplated future deck. When re-studied early in 1961, various estimates of 1965 requirements ranged from 8500 cars to 10,000 cars for the two domestic and one international terminal.

By 1970: 9550 cars

Concurrently, San Francisco was exploring its terminal parking problems. With an actual capacity in 1960 of 4650 cars in the terminal car parking areas, transportation consultants DeLeuw, Cather & Company released a study early in 1961 that indicated a 1963 requirement for 6130 cars and a 1970 requirement of 9550 cars, with future expansion required up to 14,000 cars by 1980. They concluded that 10,000 of these cars would be required for public use, and had to be convenient to the terminal complex—in its center, in fact, unless remote parking were to be used, with busses shuttling the passengers back and forth.

Idlewild in New York, with a 1961 capacity of 7100 cars, and Los Angeles, with a 4900 car capacity in its new satellite terminal complex, also had under study methods of multiplying their car parking capacities.

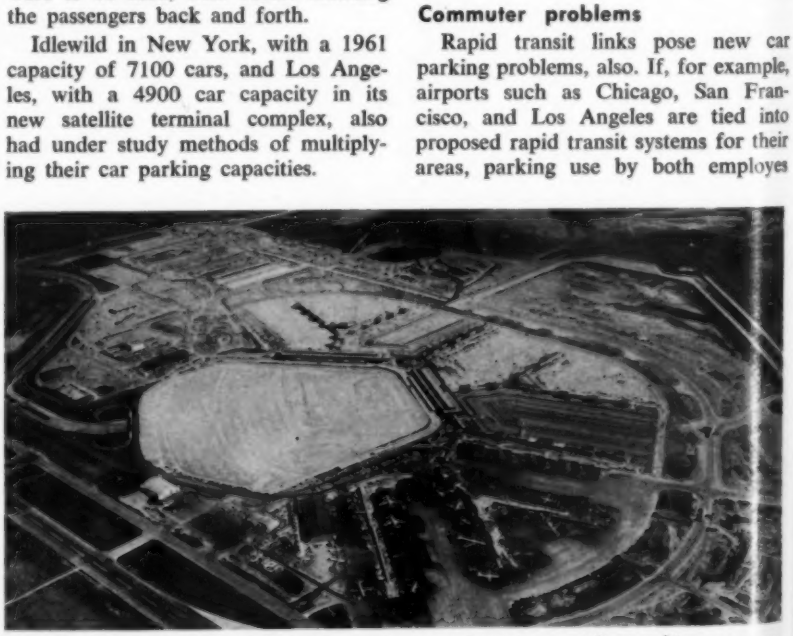
With walking distances to the fingers of the new terminal sprawls becoming critical, the walking distance to the parking lots was even more important. By establishing a desirable walking distance of 750 feet and an absolute maximum of 1000 feet from extreme parked car to the terminal, in many terminal areas the parking structure could become the "central core," from 1500 feet to 2000 feet across, with the terminals grouped around it.

At present, the San Francisco, Chicago O'Hare, and Los Angeles terminal areas conveniently fit into this concept, and the physical solution of their parking problems may thus be simplified when all the capacity and design criteria are established.

But many long-range problems face airport planners' efforts to apply a 20- to 30-year solution to these airport parking problems. Just consider the matter of mortgage financing of airport garages. Today's short-term airport parking concession agreements simply don't fill the bill, and multi-million dollar garages need long-term financing. Size and the impact of new traffic also come in for consideration.

Commuter problems

Rapid transit links pose new car parking problems, also. If, for example, airports such as Chicago, San Francisco, and Los Angeles are tied into proposed rapid transit systems for their areas, parking use by both employes



CHICAGO'S O'HARE TERMINAL, under construction, provides parking area enclosed by terminal buildings (center). Multi-level parking will be provided later.

and passengers might be lower. An offsetting factor to this, however, is the new "business center" nature of airports. They are attracting more non-passenger customers. If airports do become major transit terminals, commuters may begin leaving their cars at the airport parking areas and taking the rapid transit system to the city center to avoid the downtown congestion, unless parking fees at airports are fixed high enough to discourage them.

Fees for parking—the cost of parking for an hour, day, or week—have direct influence on the number of cars that use the parking facilities. Increase the daily and longer-term parking fees, and a certain number of passengers divert to taxis and limousines, and some have their wives drop them off, rather than park the car.

Planning for the future

Meanwhile, many airport planners attempt to rationalize the problems of future airport garage and multi-level parking requirements by proposing the installation now of footings for future multi-level parking structures, without realizing how severely this limits future design flexibility. While columnar patterns for parking structures would appear fairly typical, many alternative design solutions are becoming possible in the terminal areas which might permit the more sophisticated handling of cars. Footings fixed in place now would indicate that planners know how to design the solutions to tomorrow's airport parking problems.

That they don't have the answers is simply proved by the fact that there seems to be an almost unanimous conviction among independent parking authorities that 600 of 800 cars might well be the desirable maximum capacity of a single parking garage. Some experts say that garages with higher capacities create their own traffic congestion and flow-control troubles.

Problems may even dictate the development of two or more separate garages within each terminal area, each with separate entrance and exit roads, management, staffing, and controls. A complete separation, including award of separate concession contracts, is being discussed by some airport authorities.

Concern for pedestrians

With garages becoming almost a part of the terminal buildings themselves, signs, directions, and pedestrian access from the parking areas to the building will have to be coordinated. Pedestrian passages over and under the access roadways will be necessary in view of the parking volumes forecast. At some airports, study is being given to the feasibility of moving sidewalks.

The problems aren't limited to physical planning. With the percentages paid to airports for airport parking concessions currently ranging up to 98.5%, airport managements are becoming increasingly aware of the tight cash control they are going to have to exercise over parking operations as they change from simple lots to expensive garages.

All of the elements which affect the subsequent operation of the garages—auditing, cash verification, ticketing devices, capacity and directional electronic controls, signs—mean that new operational concepts must be developed. But, airport managements aren't alone with such problems. UNIPARK, a division of Universal Match Corporation, early this year announced a new concept of parking lot financial controls, with initial airport installations at St. Louis and Atlanta. UNIPARK reports that the St. Louis installation was experimental, installed at no charge on the condition that if the airport found the equipment satisfactory, it would purchase it, which it did in 1961.

PARKING MACHINE computes charge, displays amount and records fees on tape.

UNIPARK states that their system provides almost complete control of parking revenues for both concession and airport managements. They claim the computer system permits discharging of automobiles at least 10% more rapidly than non-computer systems. Cash control is more easily provided, because the computer, in addition to determining the parking charge, also records the charge to the customer on a tape housed in a locked console.

Tape offers flexibility

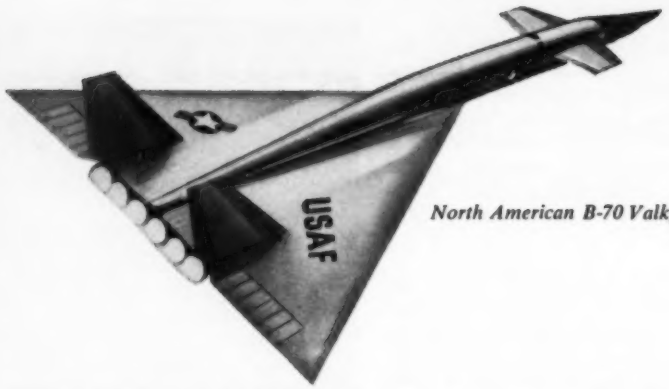
Extreme flexibility is also claimed. UNIPARK has developed a printed tape which shows the code number of each cashier, the time of day each cashier goes on duty, each transaction handled by that cashier as well as the number of cars passing each cashier or control. The tape is also designed for transfer to punch cards.

As another unique feature of the UNIPARK system, the customer serves as auditor. When the console computes the charge, the amount flashes on a "screen" visible to the customer, who can thus see the computation rather than taking the attendant's word for what was rung up on the register.

Airport parking garages are going to have to be tailored to the specific needs of each terminal complex. Built-in flexibility will have to be designed into each structure, so that changes can be accomplished without remodelling.

Airport parking garages are proving a new challenge to airport planners. Not only are they taxing their ability to solve complex technical problems, but the method of financing is going to be a major headache in itself. ■

"ULTIMATE" TERMINALS at San Francisco will be grouped around multi-level parking garages (center). Artist's concept shows four garage segments.



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PILOT TALK

By CAPT. E. J. BECHTOLD

Jet Noise Is Here To Stay

Pilots can help minimize noise but cannot eliminate it. If anyone doubts the magnitude of this problem, he need only read the daily newspapers.

I recently attended a meeting called by a Congressman at the insistence of irate citizen groups in the vicinity of Idlewild Airport. These people want relief from the noise generated by overheading aircraft when the active runway necessitates aircraft movements in their direction.

Others in attendance at this meeting included a state senator, a doctor, lawyer, church pastor, business people, housewives, and industry representatives. About a week earlier I sat with another group of industry representatives called together as a result of citizen group complaints about aircraft noise, also in the vicinity of Idlewild—but located in a *different* approach and departure flight path.

Attending meetings to discuss the noise problem in the New York area is getting to be an endless cycle, what with such groups as the National Air Transport Coordinating Committee (NATCC), the Queensboro Presidents Committee, National Aircraft Noise Abatement Council (NANAC), Federal Aviation Agency, and Port of N.Y. Authority all in the picture attempting to resolve it.

Review by Congress

Now Congress is going to tackle the problem. The House Rules Committee has cleared the way for a full scale investigation into airplane noise and hazards at Idlewild and LaGuardia and other airports throughout the country. Congressman Delaney of this Committee will introduce a bill calling for:

1. A study of safety factors around airports to help prevent accidents during landings and take-offs.

2. A study of noise conditions, especially the noise of jets on take-off and landing.

3. A study of the effect on the health of persons living in the vicinity of the airports.

That noise is more than just a "nuisance" can not be treated lightly in view of medical testimony indicating it is affecting the health of individuals both physically and mentally.

Let the record show—*No* one appreciates the noise problem more than a pilot. Pilots were the first to become irritated by it, the first to become physically affected by it, the first to recommend doing something about it. And we are still endeavoring to reduce the cockpit noise level through our Aircraft Evaluation Team recommendation on the newest jet, yet to be delivered, the B-727. There are few pilots who can't remember stuffiing cotton in their ears to reduce the noise—many still do.

Let the record show—Pilots also are acutely aware of the problem from the citizens' viewpoint. Many of us live in these affected communities. We have cooperated and will continue to cooperate with all interested parties to do everything within our ability and capability to minimize noise.

Technique exhausted

Practically speaking, however, we have reached the limit of our resourcefulness as regards individual technique and aircraft performance consistent with adequate safety margins.

In good conscience, I can even say we have stretched ourselves thin in these respects, as we have in many other areas, to satisfy the public and the passengers. We take off and land cross-wind (sometimes downwind) more often than into the wind. We make low level turns in compliance with anti-noise procedures. We make maximum performance, accelerted climb outs and descents.

We cut power when taking off over communities to reduce the noise level. We've committed ourselves to so many anti-noise procedures and patterns that this in itself has resulted in increased cockpit workload at a comparatively critical time of flight.

The magnitude of this problem cannot be belittled. Pilots can and are alleviating it but cannot cure it; nor should they be held wholly responsible for it. Two practical solutions can be found in other areas:

1. Development of a noise suppressor which really suppresses noise.

2. Adequate zoning laws to provide approach and departure paths over unpopulated areas.

In other words, a cure can be made available. The simple truth is everyone is seeking the easy way out. The cure costs money. It also may infringe on individual rights. But money is being spent by the billions on scientific development to get us out in space. Some of these dollars and technical knowledge could be diverted to the development of a noise suppressor for the public welfare. ■

ASTEK
WAS BORN YESTERDAY

Yes, ASTEK is a very young company but its engineering capability was **not** born yesterday. Its engineers have helped blaze the trail in aircraft and missile development over the past twenty years. They set the world's standard for such critical military and airline instrumentation as altimeters, machmeters, air data computers, and cabin pressure control systems. And the experience of ASTEK management in airline operation is reflected in its policy of providing off-the-shelf delivery – superior field service – operational and maintenance training – on-time delivery of maintenance manuals and parts lists.

ASTEK engineers have an unparalleled history of instrument and system designs. Some of their recent unique developments are:

■ DUALTIMETER – a precision altitude servo indicator with fail-safe operation. ■ AIRSPEEDATA – a combination air speed and mach indicator with "max.-allowable" and V$_1$ indications. ■ AUTOCONTROL – a cabin pressure control system requiring absolute minimum adjustment by flight crew. ■ HELIPANEL – a combined flight instrument for helicopters.

ASTEK
INSTRUMENT CORP.
ARMONK, NEW YORK

ABOUT PEOPLE

KECK

DE VOURSNEY

BROWN

WOOD

HANELINE

ALBERTS

BIG CHANGES AT UNITED

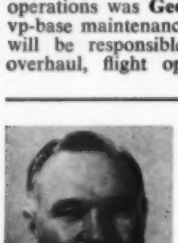
A series of top-level promotions for management personnel at United Air Lines became effective Sept. 29. Named to the newly-created post of executive vp-operations was **George E. Keck,** formerly vp-base maintenance at San Francisco. He will be responsible for engineering and overhaul, flight operations, line maintenance and transportation services.

He also was named to the Board of Directors. Also named was **A. M. de Voursney,** executive vp-administration.

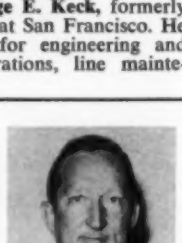
Other new assignments in the operations area include **Fred A. Brown,** elected senior vp-transportation services, succeeding **D. F. Magarrell,** due to retire in March, 1962.

P. A. Wood was elected vp-base maintenance at San Francisco, succeeding Keck. He formerly was asst. vp-engineering and maintenance.

C. E. Haneline was named vp-transportation services, east, succeeding Brown. Promoted to vp-management services and controls was **Warren E. Alberts,** previously vp and asst. to president.



RITCHIE



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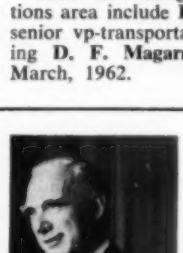
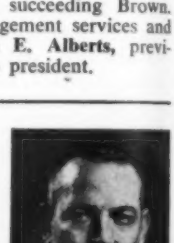


GARLOCK

EICHNER

VAN ZANT



WOLFE

IN THE AIRLINES

Capt. R. J. Ritchie has been appointed deputy chief executive and deputy general manager of Qantas. He succeeds **Capt. G. U. "Scotty" Allan,** retiring. Ritchie was director of technical services.

New assistant to the president of Civil Air Transport (CAT) is **George S. Cassady,** retired USAF Brig. Gen. who formerly was deputy director of FAA's Bureau of Air Traffic Management.

At TWA, **J. E. Frankum** becomes v.p. and gen. transportation mgr., succeeding Floyd Hall who moved up to senior v.p. and system gen. mgr.

Pierre Larcher has been nominated assistant to Henry J. Lesieur, head of the North American div. of Air France.

Advancements at Japan Air Lines include **Nobuo Matsumura,** to asst. v.p. sales administration, and **Jitsuro Kobayashi** and **Sadao Segawa,** as asst. v.p.-operations. **Susuma Saito** becomes gen. mgr.-sales; **Michio Hanaoka,** gen. mgr.-cargo/mail and **Koji Osumi,** dir. of reservations. **Hiroshi Komatsu** is new gen. mgr.-flight opns.

Lyle S. Garlock, former asst. secy., USAF, has been appointed EAL director of federal activities in Washington. He succeeds Robert Ramspeck, who retires but remains a consultant to Eastern.

At Northwest: **M. S. Brandjord** becomes director-services administration; **M. C. Lund** becomes director-ground services; and **J. C. Robertson** was named director-in-flight services.

L. John Eichner has been elected asst. vp-planning, in the finance and planning department of American Airlines.

David A. Edwards has been named vp-finance and assistant to the chairman of Slick Airways. Edwards was manager of investment for the Chesapeake and Ohio Railroad Co.

New director of traffic and sales for Trans-Texas is **Max A. King,** former vp-sales at Pacific Air Lines.

Donald L. Ingalls has been named treasurer of Alaska Airlines. He has been asst. treasurer since 1957.

AMONG THE SUPPLIERS

Air Vice-Marshal **G. P. Chamberlain** has been appointed managing director of Collins Radio Co. of England, Ltd.

Two appointments have been announced by Wilcox Electric Co. New vp-commercial marketing is **Robert R. Van Zant,** while **Clarence Lee Wolfe** was named vp-military marketing.

Robert C. Wormald has been named manager of aviation sales for Esso Standard Region of Humble Oil and Refining Co.

New director of tariffs for Official Airline Guide is **Francis A. Vlazny,** formerly traffic analyst with United Air Lines.

Hubert K. Gagos has been appointed public relations manager for the Aircraft Division of Douglas Aircraft at Long Beach. New Douglas director of Eastern commercial sales is **Gerald B. Thomas,** succeeding **J. O. Moxness,** who becomes director and general manager of commercial sales.

J. V. Naish, formerly president of Convair and seinor v.p. of General Dynamics Corp., has been elected a director of McDonnell Aircraft.

Maurice H. McGuire, former eastern division sales manager for Hydro-Aire Co., has been appointed general sales manager.

Appointments by Astek Instrument Corp. include: **James Angus,** chief engineer, mechanical; **John Thomas,** project engineer, airspeed indicators; **Frank Daleo,** sales manager, manufactured items; and **Loren Auld,** manager, publications.

New public relations manager for Bristol Siddeley Engines, Ltd., is **Alexander Johnston,** former press officer of SBAC.

OTHERS IN AVIATION

Robert Aldrich, former director of the Minneapolis-St. Paul Metropolitan Airports commission, is now operations manager of Micronics, Inc., Minneapolis.

David D. Thomas, FAA's Air Traffic Service director, has completed the 10-day senior officers' course at Air Force's Interceptor Weapons School, Tyndall AFB, Fla.

New manager of liaison activities for Aeronautical Radio, Inc. is **Thomas H. Taylor,** previously superintendent, radio navigation services at Pan American. Taylor succeeds **Walter W. Broomall,** whose death came in September after a long career in aviation electronics.

HONORS

Jerome Lederer, aviation's "Mr. Safety," director of the Flight Safety Foundation and the Cornell-Guggenheim Aviation Safety Center, has been presented the 1961 Daniel Guggenheim Medal.

Plan to Streamline Civil Air Rules Is Gaining Momentum at FAA

By BRAD DUNBAR

A policy move toward complete codification of aviation regulations—reduction of upwards of 7000 pages of regulatory material to "approximately 60 simplified rules"—has captured the interest of FAA observers in an otherwise slack period of no more than routine regulation.

The long-range codification project actually was begun by former Administrator E. R. Quesada, but now has been blessed with an official agency order by Administrator Najeeb Halaby and placed in the hands of a new chief codification attorney, James B. Minor. The job will take more than two years, FAA says.

In routine rulemaking:

• Manual or automatic emergency-exit lighting in day as well as night operations by scheduled and irregular carriers has been proposed as the result of the 1961 American Airlines Electra crash at LaGuardia in which lighting system failure complicated escape from passenger cabin and flight deck; comment on the proposal is due on or before Nov. 15. . . . Long-discussed pilot class ratings for helicopters as opposed to "gyroplanes," now lumped despite their dissimilar piloting techniques as "rotorcraft," has been proposed; comment is sought on or before Nov. 30. . . .

The last requirement for carrying landing flares for overwater night flights has been dropped from the CARs. . . . Recency-of-experience requirements would be eased for pilots of scheduled helicopter carriers because of the high number of landings and takeoffs they execute in their frequent, short-haul operations; amendment of Part 46 would, among other changes, extend 30-day landing-takeoff experience time to 90 days; comment is due Nov. 9. . . . Rulewriters are proposing standards for approval of transport aircraft simulators and their use in pilot training and proficiency checks; comment is sought on or before Nov. 9. . . .

Rewriting Part 43 general aviation rules will be based on a painstaking two-year process beginning with 90 local conferences throughout the country last month, more formal pre-rulemaking conferences over tentative FAA proposals next March and April, and subsequent final rules, all aimed at a July, 1963 completion date, according to a Flight Standards Service announcement. . . . The ceiling of the Chicago-Indianapolis Centers' "Pathfinder" positive control area was raised from 35,000 to 60,000 ft. . . . FAA would make flight and ground attendants responsible—with continued over-all pilot responsibility—for keeping drunks off airline aircraft. Comment on the proposal is already in.

SYSTEMWORTHY SST

FAA Flight Standards Service Chief George C. Prill has quietly pointed out FAA's current concept of its own regulatory philosophy regarding the coming supersonic transport era—"system-worthiness."

In a joint paper (with Research & Development Service's Aeronautics Branch Chief Harold Hoekstra) delivered before the Eighth Anglo-American Aeronautical Conference in London, Prill said subsonic jet experience and study of the SST shows the SST must be more than simply certificated as an "airworthy aircraft;" its airports, traffic control, weather and communications as well as the SST itself must be developed as a package and found "systemworthy."

VIOLATIONS

Delta Air Lines has shown FAA's enforcement machinery to be something less than perfect in a case which probably well illustrates the occasional overzealousness of its inspectors. FAA withdrew a number of charges and accepted a $5000 compromise fine from Delta in settlement of two cases in which the agency originally had sought $30,000 in fines.

Charges settled with the fine involved (1) 14 DC-8 flights in 1959 with an inoperative master warning light system, six with one freon system inoperative, and one with the nosewheel landing lights out, (2) 10 counts of failing to provide required maintenance log data on aircraft and engine times for ready inspection by crew members, (3) failing to suspend operations on an icy Midway runway in February, 1960, resulting in the over-run of a C-46 cargo flight, and (4) for a Jan. 18, 1960 maintenance incident in which DAL mechanics reversed the pitot and static lines on a Convair 340, aborting a flight.

Delta successfully countered four charges involving training, instrument marking, flight check requirements and maintenance personnel certification, and argued that most of the remaining charges represented "technicalities" in application of the CARs. FAA said it took into consideration the withdrawal of the charges and other "mitigating factors."

• Another sizeable compromise saw the agency accept $2000 rather than $15,000 from **Overseas National Airways** for a series of 35 counts charging violations of flight scheduling, flight time, maintenance and record-keeping regulations through the summer of 1960.

• The passenger on a July 8 United DC-8, **Joseph Newkirk,** whose drinking and knife-wielding ruckus first focused nationwide attention on the lack of federal jurisdiction over airborne crime, has paid a $500 fine, half of the maximum allowable. FAA said it also considered that he was jailed by Los Angeles authorities for 90 days.

• Other violations: A $700 fine from **American Airlines** on four maintenance violations involving communications, generator and engine work and a failure to update "some" AA maintenance manuals . . . A $500 fine from **Frontier Airlines** for using an unauthorized refueling point . . . a $250 fine from **Interior Airways** for inadequate radio equipment maintenance facilities, and for a C-46 flight last March which carried improperly maintained ADF gear. . . .

A fine of $350 from **Douglas Bell,** president of **Associated Air Transport,** Miami, for his part as pilot-in-command of a C-46 which his co-pilot landed wheels-up in a simulated landing emergency . . . Revocation of the ATR of **George A. Robertson,** Miami Springs, Fla., after a hearing which FAA granted when it found Robertson had not been fully heard prior to a previous revocation order. . . .

A 15-day ATR suspension, effective Oct. 16, against **Capt. Orval F. Sturdevant,** Glen Ellyn, Ill., pilot-in-command of a UAL Boeing 720 last Jan. 16 which left its cleared airway, crossed another and came within eight miles of a Capital Airlines flight on a third before it was vectored back on course by ATC radar. . . .

An ATR suspension, retroactive to Feb. 10-April 10, on **Capt. Marshall B. McDonald,** Ft. Worth, pilot-in-command of a Delta Convair 440 which landed by mistake at Polleck Field instead of Esler Field, Alexandria, La., on a Dallas-New Orleans flight . . . A retroactive two-month, 22-day ATR suspension on **Capt. P. Camerer,** Tacoma, Wash., and **Capt. B. F. Ritchie,** Minneapolis, first officer and captain of a Northwest Airlines DC-6B which landed without clearance or dispatch at an uncontrolled field at Fergus Falls, Minn., last March 7. . . .

A 180-day ATR suspension on **John V. Florio,** Metairie, La., pilot-in-command of a Southern Airways DC-3 last Feb. 21 who took off from Memphis in weather below his minimums . . . A 15-day ATR suspension on **Capt. Donald R. Lambert,** Pittstown, N.J., pilot-in-command of an Allegheny Airlines' Convair 440 who "deviated" from his ATC clearance without obtaining an amended clearance. . . .

A $1000 fine paid by **American Airlines** for making five separate flights with a 707 before a "precautionary" change of the captain's stabilizer trim switch . . . A $1000 fine from **Pan American World Airways** for a maintenance slip-up, resulting from failure to fully correct a misprinted inspection work card, which put a 707 with a binding aileron control on the line at Idlewild. . . .

A $250 compromise fine paid by **Pacific Airmotive Corp.** in settlement of a charge that the firm's personnel had left shop towels in the intermediate bearing support housing of an engine Sept. 19, 1960 . . . A $350 compromise accepted from **Capt. W. J. Peters Jr.,** Aurora, Calif., settling a charge that as pilot-in-command of a June 21, 1960 Western Airlines DC-6B landing at Stapleton Field, Denver, he failed to follow promptly a left-turn go-around order and passed too close over the top of a civilian aircraft. . . .

A $750 fine paid by **Piedmont Airlines** for an unapproved alteration of an F-27 that resulted in an aborted takeoff from Cincinnati Sept. 8, 1960, and for another flight that month carrying improperly packed or marked "dangerous articles"—two electrolite-filled batteries. . . . ■

AIRLIFTS

• **Short-lived comfort?** United Air Lines' flight crews had a nice cool summer, but they have cause to wonder about next year. UAL crews shed their coats, wore short-sleeved shirts with epaulettes showing rank (see photo).

COOL PILOTS this past summer were flying United in these short-sleeve uniform shirts marked with dark blue epaulets. Captains wear four bars, first officer has three and flight engineer two.

Someone asked UAL president W. A. Patterson about the possibility of ground personnel wearing such shirts. Pat's answer shook up a lot of people. "When I agreed to an experiment with a short-sleeved shirt for pilots, I understood that this was a comfort feature for them in the cockpit," he said. "I did not know our flight crews would go coatless when in public view.

"Now I am not sure that we made the right decision. The ridicule and criticism I have heard from the public —that by comparison with other airlines which require their flight crews to wear their uniform coats when in public, ours remind them of bus drivers —indicates to me that we should move very slowly in any further change . . .

"These comments come from people who are very friendly to our company and to our pilots. I resent any reference to a comparison with bus drivers. I want our pilots to enjoy the standing and dignity of an important profession. I think we and they make a mistake in going coatless when in the public eye . . . I now feel it would be wrong to expand something that apparently is not well received."

• **Touche!** A Delta passenger, informed that the airline would like him to check in 40 minutes before departure for a 40-minute flight, snorted: "What are we going to do—rehearse?"

• **Believe it or not,** North Central checked in two passengers at Hibbing, Minn., named Orville and Wilber Wright. The NOR agent couldn't resist asking whether they were related to the famous Wright brothers. Answer was negative.

• **Biggest passenger** ever to ride Piedmont Airlines was Eddie Carmel. He's 9 ft. tall, weighs 535 lbs., wears size 35 shoe. Eddie, who was appearing at the Guilford County Exposition, required two seats and had to bend nearly double to get up the aisle of Piedmont's F-27.

• **Trow Seebree,** long-time Capital Airlines pilot and the company's director of operations in the late 40's, is now flying for United, with one year to go before retirement. He now lives in New Orleans, has never been happier, and has built a miniature railroad around his place. Address: 10016 Walden Place, New Orleans 23, La.

• **Two scraps of paper** were discovered recently on the wall of a seldom-used pumphouse on a ranch near Butte, Mont. They are the oldest known tickets issued by National Parks Airways. On the second day of NPA's operation, Aug. 2, 1928, Fred Hennigsen flew from Butte to Great Falls and back on one of the airline's Super-Universal Fokkers. He then tacked the tickets on the pumphouse wall, where they were discovered 33 years later by his nephew, Ralph Cole, who is Western Air Lines' Idaho Falls station manager.

Hennigsen recalls that his proposed trip was delayed two days while NPA's crews gave each employe of the new company an introductory ride before accepting cash customers. In 1937, NPA's 523 miles of routes between Salt Lake City and Great Falls were absorbed by Western. Hennigsen's old tickets are now in WAL's archives in Los Angeles.

I'M SORRY SIR, we don't have a standard fare for adults between here and New York. Staff cartoon.

• **There are no strings attached** to the new baggage tag (below) being tested by TWA. The tag, which looks like a long strip of paper, is attached to the bag (after passenger's claim stub has been removed) by bending it around the handle and sealing the ends with a special adhesive. It's being tested on certain flights serving Kansas City. Reaction so far is described as "extremely favorable." Advantages: faster tagging, easier storing, costs about half as much as a regular tag.

WRAP-AROUND baggage tag now undergoing trials with TWA eliminates strings which clutter up bag handles.

• **Back in 1929** Northwest Airlines was flying single-engined six-passenger Hamiltons, built in Milwaukee. A year or so ago, one of the aged Hamiltons was found in Alaska, shipped to the NWA base in the Twin Cities, and refurbished.

Don Nyrop, NWA president, wanted to use it for special flights and even for offering transportation to nostalgic customers of 1929. A fine promotional idea—except for one thing. FAA has refused to okay the Hamilton for scheduled passenger use!

(Ed. Note) How unrealistic can FAA get. Imagine an airline proposing to carry passengers in the airplane if it didn't think it was airworthy. We can't.

• **New terminal, old idea**—TWA's handsome new terminal at Idlewild is set for 1962 opening but it's been underway so long that it's known in TWA as the "Five Presidents' Terminal." It was actually authorized during the presidency of the late Ralph Damon and that, as anyone knows, was quite a few TWA presidents ago. ■

ON-TIME BOXSCORE

AUGUST, 1961

Airline Ranking		Total Trips	On time to 15 min. late
TRUNKS			
1	Braniff	1217	86.6%
2	Eastern	6004	86.5
3	National	872	81.8
4	American	6620	80.4
5	Continental	1546	79.4
6	Northeast	3035	69.6
7	Delta	2132	69.0
8	Northwest	940	64.2
9	Western	1351	63.8
10	TWA and United	No Report	
707 & DC-8			
1	National	275	79.6%
2	Eastern	794	78.9
3	Braniff	279	76.3
4	Continental	512	75.5
5	American	2149	65.9
6	Delta	474	55.0
7	Western	243	45.2
8	Northwest	147	42.8
9	TWA and United	No Report	
720			
1	Northwest	143	44.7%
2	Western	334	32.6
3	United	No Report	
880			
1	Delta	410	70.0%
2	Northeast	477	56.6
3	TWA	No Report	
CARAVELLE (United—No Report)			
ELECTRA			
1	Eastern	1522	85.1%
2	American	1370	84.2
3	Western	514	78.7
4	National	170	77.0
5	Braniff	212	75.4
6	Northwest	238	52.1
LOCAL SERVICE			
1	West Coast	247	96.7%
2	Trans-Texas	290	92.4
3	Frontier	511	91.3
4	Southern	397	89.4
5	Ozark	606	89.2
6	Piedmont	35	88.5
7	Pacific	66	86.3
8	Allegheny	678	83.7
9	North Central	1267	82.0
10	Central	292	79.1
11	Bonanza	442	77.8
12	Lake Central	517	75.4
13	Mohawk	776	67.2

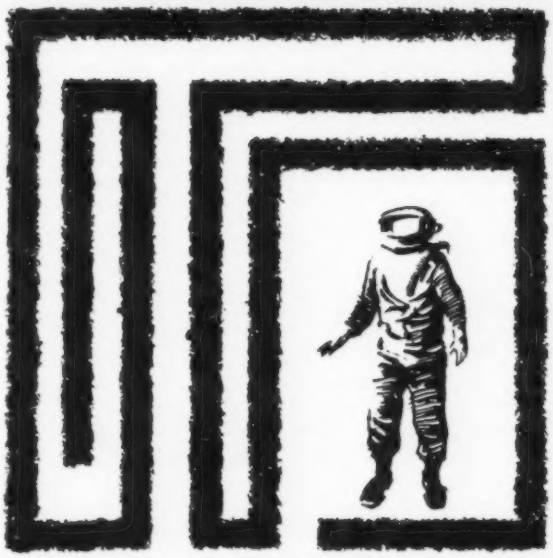
LATE ON TIME REPORTS

JULY, 1961

TRUNKS		
TWA	3233	82.4%
National	827	77.2
United	6859	69.0
Northwest	945	65.8
707 & DC-8		
National	284	79.5%
TWA	1202	79.4
United	1435	57.7
Northwest	167	44.3
720		
United	897	70.9%
Northwest	122	28.6
CARAVELLE		
United	82	67.0%
ELECTRA		
Northwest	237	68.7%
National	163	63.8

SOURCE: AIRLIFT Research.
Note: Nonstop and one-stop flights only.

ENVIRONMENTAL



BREATHING

...from Puritan

A leading authority in the development of oxygen breathing techniques in the field of medicine, Puritan was among the first to develop oxygen breathing systems for commercial air travel.

In applying its medical knowledge to the problems and objectives of aviation, Puritan recognized the necessity of providing ground level physiological environment during high altitude flight.

Puritan aerospace breathing systems are so designed and engineered. Your inquiry will receive prompt attention.

AEROSPACE DIVISION
Puritan EQUIPMENT, INC.
1703 McGee Street • Kansas City 8, Mo.
A subsidiary of PURITAN COMPRESSED GAS CORPORATION

BREATHING LIFE INTO AIR AND SPACE TRAVEL

NEWS IN BRIEF

EQUIPMENT

Luxembourg—Luxair, newly formed Belgian carrier, is leasing an F-27 from Fokker.

Paris—French budget for 1962 allows for Air France purchase of four fan-powered 707-320Bs and seven Caravelles. Orders would raise AF Boeing fleet to 21 and Caravelles to 40.

London—BOAC is offering seven of its 10 DC-7Cs for resale. Two of the remaining three have been converted to cargo layout.

U.S.—Western Air Lines has signed up for three more Boeing 720Bs for July-August-1962 delivery. Its fleet becomes seven 720Bs and two leased 707s.

Ozark Air Lines has purchased four Convair 240s through Houston Aviation Products, Houston.

Nigeria—Nigerian Airways has ordered five and optioned two Fokker F-27s for delivery in December 1962 and January 1963. It raises Fokker sales total to 110.

Ottawa—Four additional Boeing Vertol 107 Helicopters have been ordered for the Royal Canadian Air Force. Total order now stands at six.

Conversion—Five of Northwest's DC-7C aircraft are being converted by Douglas to freight configuration. Converted aircraft will carry 95 passengers or 25,000 lbs. of cargo for 3500 miles. First delivery was in August.

Distinctive feature will be 82 by 124-inch forward cargo door. Similar door, in Northwest's DC-6A, measures 67 by 91 in.

Montreal—CL-44 gross takeoff weight has been upped, by 5000 lbs., to 210,000 lbs. Result is range extension by 11 percent to 3250 statute miles with 63,900-lb. payload.

Cologne—Lufthansa may purchase the Max Holste M.H. 262 Super Broussard for domestic route service. First 262 will fly next year, with deliveries expected by 1963.

New York—American Airlines has signed a new contract with General Dynamics covering delivery of the Convair 990. Aircraft will be delivered with guaranteed speed of 584 mph at 21,200 ft. Delivery of 15 will begin in December, 1961, to be completed by June, 1962.

Meanwhile, General Dynamics will institute a speed-improvement program to increase the aircraft's speed to a guaranteed 610 mph at 21,200 ft. When this has been achieved, GD will modify the original 15 aircraft to meet the higher speed guarantee.

TOP ORDER of the month is Braniff Airways' commitment to buy six British Aircraft Corp. BAC-111 shorthaul twin-jets for October 1964 with an option for six orders for mid-1965 delivery. (See Industry at a Glance, p. 13). The BNF version will be fitted with 39 coach and 24 first-class seats. Total order including options and spares is valued at about $35 million.

If a cruising speed of 620 mph can be achieved, AA will purchase five additional aircraft, bringing its total order to 20. Original contract called for delivery of 25.

London—Two Britannia 312s will be leased to British United Airways by BOAC, with purchase option. Aircraft will release Viscounts now employed on East and Central African routes.

Rio de Janeiro—Panair do Brasil has ordered four Caravelle 6Rs and optioned two others.

MANAGEMENT

Caribair deal—Trans Caribbean Airways is acquiring 16% holding in Caribbean Atlantic Airways (Caribair) making it third largest shareholder. Trigo family holds 51.12% and Laurence Rockefeller interests have 20%.

Expansion at Riddle—Against a backdrop of otherwise gloomy airline financial statements, Riddle Airlines announced first quarter earnings (July-September) of $1 million on $8 million revenues and a plan to double the size of its DC-7CF cargo fleet from 10 to 20 aircraft. The new aircraft are being purchased from SAS and Swissair.

LABOR

Literature—National Mediation Board has issued a booklet covering analysis of labor dispute hearings held between July 1, 1934 and June 30, 1961.

FAA

Pyle moves out—James T. Pyle leaves FAA post of deputy administrator to join General Precision, Inc. in a Washington position on Dec. 1.

Supersonics—AF Col. Lucian S. Rochte is directing a newly-formed FAA supersonic transport management office.

Certification—Type certificate has been awarded to GE for its CJ805-23 aft fan engine.

AIRPORTS

Oklahoma City—This city's expanded executive airport was renamed Wiley Post Airport in ceremonies on Oct. 21-22 giving Oklahoma City two commercial airports named after the state's foremost aviation pioneers—Will Rogers and Wiley Post—who died together in a crash at Pt. Barrow, Alaska on August 15, 1935.

Miami—Pan Am has reached agreement with Dade County Port Authority on a $5 million expansion of its base facilities here, forestalling their transfer to New York.

Pittsburgh—Allegheny has signed agreement with Allegheny County, Pa. officials to build a $4 million maintenance center and fixed-base operation at Greater Pittsburgh airport.

Washington—Final U.S. airport aid legislation provides $150 million through June 30, 1963 but legalizes aid until mid-1964.

Jordan—A new international airport, situated 1300 ft. below sea level near the Dead Sea, is being planned. It will be called Jerusalem International.

Geneva—Swissair has opened duty-free shops at Cointrin Airport in Geneva and at Kloten airport in Zurich, intended for use of passengers departing Switzerland.

Houston—The city of Houston, which saw its population explode from 596,000 in 1950 to 932,000 in 1960 (up 56%) has approved the master plan for a new $125 million to $150 million airport. First stage will cost $55 million. Airport will be situated on a 6000-acre site being acquired 15 miles north of downtown Houston. First operations are anticipated in late 1963.

CARGO

Directory—Annual "Directory of Air Freight Services," by Air Cargo, Inc., lists information on routings and rates for air freight movement throughout the U.S.

Miami—Riddle Airlines leased two hangars and an office building at Miami International Airport with plans to establish completely automated air freight terminal. Office building will house cargo carrier's executive offices.

EMPLOYMENT

Chicago—United Air Lines opened classes to train 260 new flight engineers over the next six months. Flight operations senior v.p. D. R. Petty said more second officers would be needed to meet a boost in flight schedules.

ROUTES

Third-level carrier—Executive Air Transport, St. Louis, has applied to CAB for certification in the Missouri, Indiana and Illinois area from a St. Louis base of operations. President is W. C. Moessmer, Lamburt Field, St. Louis.

Helicopters—Eastern Copter Service, Pittsfield, Mass., is seeking CAB approval to operate Omega BS-12D1s, Vertol 44s and eventually Vertol 107s in New England area. It would buy five Omegas, the five New York Airways' 44s being returned to Boeing for 107s, and is negotiating for five 107s. John L. Hawkins is president.

ELECTRONICS

Paris—ICAO's Fourth North Atlantic Regional Air Navigation Meeting wound up after a four-week session, the first full-scale meeting since 1954, called to consider technical problems in North Atlantic navigation. On the agenda was use of additional teletype circuits provided by new submarine cable from Newfoundland to Scotland, due for implementation next year.

Washington—FAA Administrator Najeeb Halaby officially verified rumors that Data Processing Central, once slated for implementation at Boston in 1962, is in for drastic revision. But until the release of Project Beacon—originally set for August 1—no official word would be available on equipment or systems to take its place.

Although Beacon itself remained a mystery, advance hint of its content indicated joint civil-military use of SAGE for high altitude ATC would not be attempted. The decision kills an experiment which would have moved handling of the Washington high altitude sector to Ft. Lee, Va., this fall.

Toronto—Low-cost method of relaying radar pictures via telephone lines was announced by Raytheon Canada, Ltd., at IRE convention in October. Developed under contract with Canadian Department of Transport, technique will make it economically possible for flight controllers to hand-on control from one center to the next in Canada.

Washington—Radio Technical Commission for Aeronautics scheduled both Fred M. Glass, chairman of FAA's Project Horizon, and Richard R. Hough, Project Beacon chairman, for its Nov. 1 annual meeting. Also on the speaking agenda were FAA administrator Najeeb Halaby, R&D head Joseph D. Blatt, and Aviation Facilities Service head Joseph H. Tibbets.

DME—Production units of Narco's UDI-2 distance measuring equipment continued flowing off the production line at Fort Washington, Pa. at the rate of about 25 per week. Narco developed the "light-weight" unit under FAA contract.

Development—Sylvania Electric Products, Inc., announced development of "Wamoscope" wideband microwave detector, amplifier and cathode ray display enclosed in a single vacuum envelope. Unit could be used for cockpit display of obscured runway during approach, or as airport surface radar for monitoring of taxi strips and aprons.

MISCELLANY

Gate Times—Trans-Texas Airways has issued a quick-reference guide to gate times. Coat-pocket edition has decoding chart, lists, in alphabetical order, all cities served by TTA.

Stewardesses wanted—Central African Airways plans to replace male African Skybus conductors with African air hostesses, and has advertised for candidates from whom a beginning figure of four will be recruited. In addition to English, applicants must speak Chinyanja, and either Shona or Bemba.

Meal service—Northwest Airlines has begun serving the St. Paul Capital Cut, a newly developed beef steak, on domestic flights. New cut, developed by Armour, comes from rib sections of yearling steers, is deboned, aged and trimmed to specified thickness.

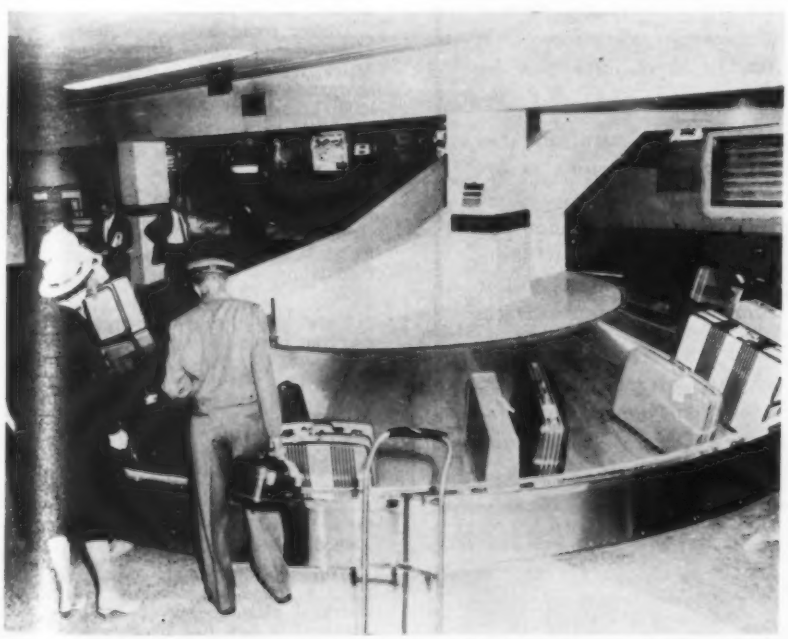
Fashions—Lake Central stewardesses are wearing new uniforms designed by Don Loper of Beverly Hills. Suits are fashioned from charcoal gray herringbone worsted wool, feature distinctive contour hat and white dacron blouse.

Handbook—ATA handbook on aircraft ground clearance measurements has been prepared as a guide to snow removal for airport managers. Booklet contains drawings, charts, and suggestions on effective snow removal procedures.

Football—UCLA is flying Western Air Lines en route to away games. Denver (AF Academy), Detroit (Michigan), Columbus (Ohio State) and San Francisco (Stanford) are on the Bruins' schedule.

Milestone—Riddle Airlines reports the first quarterly profit in the history of the airline—$1,041,443 on net revenues of $8,347,815 for July-September, the first quarter of its fiscal year.

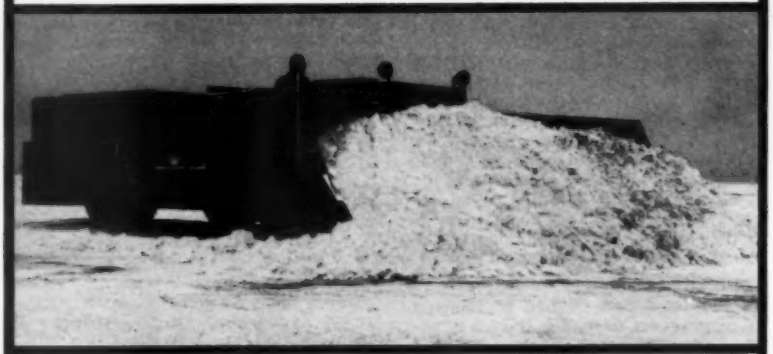
Interline computer—Univac has settled on the name Unicall for the automatic inquiry voice-reply device around which its AID (airline interline development) system operates (See (*AIRLIFT*, Sept., p. 24).



BAGGAGE CAROUSEL, first of its kind at a U.S. airport, is now in operation by United Air Lines at San Francisco. Unit is 25 ft. in diameter and rotates at 1.2 rpm (once in 50 seconds). This popular approach to eliminating traffic jams in claim areas was introduced at Montreal's new terminal and is produced by Mathews Conveyor Co. of San Carlos, Calif.

When snows come like this...

will you be prepared like this?



Remember last Winter when prolonged snow storms disrupted flight schedules and created numerous costly delays?

To effectively combat sustained snowfalls, existing Models T-225SL and T-300SL PAYMOVER towing tractors can become high speed (up to 20 mph.) snow fighters in 15 minutes time by adding a special snow dozer attachment.

This blade is 50" high, has vertical hydraulic control and can clear a 20' wide path over apron and ramp areas in one sweep. It is specially designed to retain its snow load through a unique tumbling action that keeps side spillage to a minimum and eliminates the need for additional passes. A special tripping mechanism permits the bottom of each side plate to follow ground contours. This allows working over uneven surfaces without reducing travel speed.

With only a minimum investment for this dozer blade, you can convert your PAYMOVER tractor into a dual purpose machine that will provide one of the basic tools you need for Winter maintenance. Call or write for complete information.

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10-E-3

Brake on brakes—Trials with new liquid-cooled brakes on a United Air Lines Boeing jet have been delayed indefinitely by problems of reservoir to flap clearance and under-capacity of the heat exchanger.

New ATA office—Air Transport Assn. has set up a new office of international services under director Norman Philion and associate director Harvey J. Wexler.

Supersonics—IATA has published a 215-page summary of the supersonic transport symposium held last April in Montreal. Copies are available at $2.50 each and complete set of working papers at $10 from IATA Technical Secretariat, 1060 University St., Montreal 3, Canada.

NEW BUSINESS

Simulator—General Precision's Link Division has signed a contract with Eastern Airlines for flight simulator to be used for Boeing 727 pilot training. Unit will be designed with new techniques to more accurately simulate conditions of high-speed flight.

Spoiler power—Contract to supply spoiler actuator power control package for Boeing 727 has been awarded to Weston Hydraulics, Inc. Deliveries begin next year.

Navigation—Lufthansa announced it would equip its entire jet fleet with Collins DN-101/NC-103 doppler radar navigation systems. Orders totaled 22 units, with option for additional 20.

Troposcat—Page communications was awarded FAA contract to design and provide two long-distance vhf ground-air-ground antenna arrays to be used in tropospheric scatter experiments over the North Atlantic. Goal of FAA project is 98% utilization.

Trident communications—British European Airways will install Marconi "Sixty Series" transistorized communications and navigation gear in its fleet of 24 de Havilland Trident aircraft. Navigation equipment will be used with "Autoland" system to provide all-weather capability for the Trident.

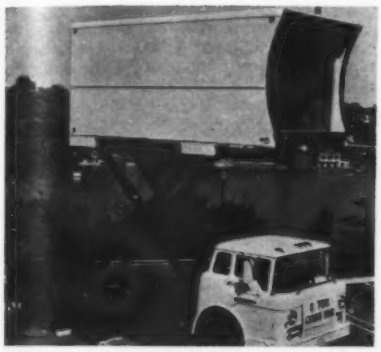
Engine monitor—BOAC has installed a Bendix Scintilla temperature and vibration monitor (*AIRLIFT*, Jan., '60) in each of its 15 Rolls-Royce-Conway-powered 707s. Installations will be completed by January, 1962.

Snow job—Portland International Airport has purchased a new Sicard SW-112 snow sweeper designed to clean a million square feet of runway an hour. It moves at 25 mph and sweeps a 12-foot wide path. Manufacturer is Sicard Industries, Watertown, N.Y.

Flight recorders—Ansett-ANA and Trans Australia Airlines have agreed on a standard flight recorder, ordering 70 from United Data Control, Los Angeles, valued at $340,000.

Turco goes ultrasonic—Turco Products, Inc., a name synonomous with airline overhaul cleaning operations, has added a complete new line of ultrasonic cleaning equipment including generators ranging from 125 to 25,000 watts and tanks from 1.5 to 36 gallons. New brochure describes complete line. Request from Turco at 24600 S. Main St., Wilmington, Calif.

Eight-Ton Cargo Lift Van Expands Cresci Line of Ground Support Equipment



CRESCI 8-TON UNIT extends to floor height of 15 ft. 9 in. Note how van moves forward over cab.

AT LOWER LEVELS, unit can match any aircraft floor height as long as underside of van clears cab.

IN GROUND LOADING POSITION, Cresci unit has smart truck lines which conceal its highlift capabilities.

A. Cresci & Son, Inc., a small Vineland, N.J. firm which began building lift trucks 50 years ago for coal delivery, is expanding its line of airline ground support equipment.

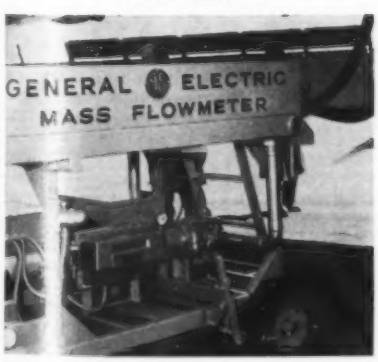
Its newest item, an 8-ton cargo lift van, was unveiled recently by president Paul Cresci during the ATA's ground equipment and facilities meeting in Washington, D.C.

The new Cresci unit is one of the most flexible items of loading gear yet to appear on the airline scene. Fully equipped with dual controls for cab or van operation, it can be raised to a height of 15' 9" or adjusted to any lower aircraft floor level. Once the underside of the lift van clears the cab, it can be moved forward up to six feet. A curved forward opening is designed to "mate" with a variety of fuselage outlines.

The body has an overall length of 16 ft. 6 in. Inside length is 15 ft. 3.5 in., width 90.5 in. and height 72.5 in. One big attraction in the 8-ton Cresci unit is the ideal positioning of the operator as the unit is approaching the aircraft. Controls mounted in the forward left wall of the lift van bring him within inches of the mating edge of the platform with all the controls necessary for complete operation of the unit.

Cresci first produced aviation cargo lift gear during the Berlin airlift, but has since gained a wider reputation among airlines for its high-lift commissary units. In all, the firm has built about 500 high-lift units for the airlines and U.S. military services.

Flowmeter



G.E. mass flowmeter.

A mass flowmeter for ground refueling of jet aircraft is now available from General Electric. System uses G.E. true mass flowmeter, designed to eliminate volume-to-mass conversion errors due to ability directly to measure fuel mass and read out in any desired unit of weight.

Measurement is independent of variables such as density, viscosity, temperature and fluid composition. Fuel amount may be read out on a variety of ticket printers or counters.

Flowmeters are adaptable to mounting on ground carts or directly on tank trucks. Each system includes one Type LB-2 integrating mass flowmeter, one battery operated power supply and a pulse-operated ticket printer.

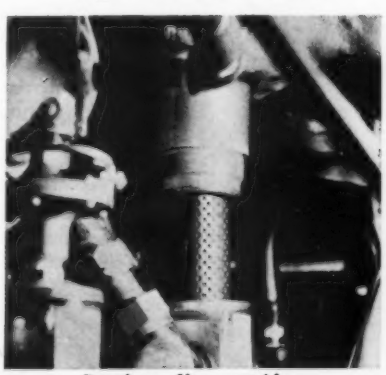
Microphone

A transistorized, dynamic handset manufactured by Electro-Voice, Inc., Buchanan, Mich., is being used on United's DC-8 and 720 aircraft in stewardess-operated passenger-announcement systems.

The Model 625 covers the speech range of 200 to 4000 cps. Impedance matches 100 to 500 ohm carbon input. Polar pattern is bidirectional pressure gradient (differential close-talking). Output level is –20 db. Output is 4 v. with 24 v. power supply and 250-ohm load.

Electro-Voice stewardess microphone.

High Pressure Filters



Purolator filter cartridge.

A hydraulic components test stand, produced by United Manufacturing Co. of Hamden, Conn., capable of supplying fluid at 30 gpm with pressures of 3000 psig and static pressures to 10,000 psig, utilizes high pressure filters manufac-

tured by Purolator Products, Inc., Rahway, N.J.

The filters operate at flows of 28 gpm at 5000 psi and provide 10-micron filtration. The filters can be serviced without disturbing system connections and are equipped with an internal relief valve to provide bypass flow of fluid in event of stoppage.

Fastener

A new clip nut series is being offered by Shur-Lok Corp. as an addition to its SL88 series. The new line is identified as SL100, features a spring clip to guard against excessive loading.

Structural integrity is assured by "wrap-around" retainer design, through which spring and retainer work together to resist torque-out and push-out. Sizes offered include 8-32 and 10-32, for mounting on panels up to .090 thick and with edge margin to ½ in.

Rain Repellent

A rain repellent kit containing repellent, glass cleaner and rinse and tissues for application is now offered by Regal Air Corp. after two years of research and development by the Navy and the laboratories of Foster D. Snell, Inc.

The RR 990 Rain Repellent requires no preparation on a clean windshield. It may be used on glass or acrylic windshields. As rain drops hit the windshield, they remain in droplet form and are carried off in the air stream.

Application involves washing the windshield and then spreading on a thin film of the liquid repellent. No intermediate steps are necessary.

Moving Map Display

A moving-map cockpit display which presents continuous information on position and track is offered by Ferranti Ltd., Edinburgh. The display is fed with "northern and easterly components" of ground speed with track angle from an external navigation computer.

The unit uses standard air navigation charts at a scale of 1:500,000 which are reproduced on 35mm color film, optically projected on a 6 in. diameter ground-glass screen. Controls permit adjustment of focus and brightness.

Arrangement of the transparencies controls the areas covered. Each map spans an area 120 by 180 nautical miles, thus it is possible to store maps covering, for example, the whole of Europe, on a single strip of film.

Ferranti moving map.

Transponder Test Set

Features for checking any two- or three-pulse ATC transponder are found in the Kearfott L-Band Transponder Test Set. Used in conjunction with a suitable oscilloscope, the unit provides amplitude control of each pulse in the interrogation train, which permits checking the side lobe suppression features of a transponder.

An internal pulse-modulated signal generator is used to simulate a ground station for checkout of a transponder's receiver and decoder. Another circuit permits checkout of the encoder and transmitter.

The RF level of all three pulses can be controlled, as can the amplitude of any one of the pulses within the pulse train. Variable time delay between pulses permit simulation of all ATC Beacon and military interrogation modes.

Portable Tester

Tach-RPM systems can be tested "in-place" with the Conair "Con-Tach" TT-3 tester manufactured by Consolidated Airborne Systems, Inc. The portable unit is offered at relatively low cost, can be

1280th Caravelle SEAT
by AEROTHERM

While United Air Lines was planning to introduce Caravelle aircraft service to the American public, they came to Aerotherm with the most exacting seating requirements. They wanted not just another airplane seat, but a unit with outstanding quality and exceptional passenger appeal. Cooperating with UAL engineers, Aerotherm designed, developed and produced a unit which met United's high standards of design and performance.

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used for ramp testing or on the workbench.

Self-contained, the TT-3 tester can be used for output voltage measurements for 2-pole and 4-pole generators; indicator speed calibration; indicator starting voltage tests; and engine run-up and tach calibration.

Design features include a stable shunt-motor master drive, separate mounting pads for 2- and 4-pole generators, voltage meter and precision resistors for applying all standard loads to Y- and delta-wound generators, an internal master generator, and an output voltage control.

"Con-Tach" TT-3 Tester.

Vecto Flight System

A one-instrument flight director which displays speed, directional and climb-angle control data has been developed by the Vecto Instrument Corp. The instrument is aimed specifically at providing data which permits the pilot quickly to achieve the correct aircraft attitude in any normal or emergency segment of flight.

The instrument measures angle of attack above or below the earth's horizon. Predetermined power settings for each of the specific aircraft's performance attitudes are preset in the computer, which electronically relates all factors of thrust, lift and velocity to pitch attitude.

The pilot is provided with a precomputed attitude presentation by the Vecto Attitude Reference Indicator. The system is adaptable to all multi-engined aircraft.

Vecto flight director.

Parts Cleaner

A new bench model parts cleaner utilizing "vatronic cleaning" for small parts has been developed by Currier Co., Belmont, Calif. Originally developed for

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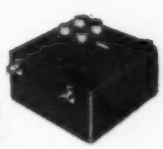
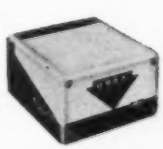
JETCAL® Analyzer

Tests EGT system accuracy to ±4°C *(functionally, without running the engines!)* Runs temperature spread check on two engines at same time. Cuts test time 50%. Tests RPM accuracy to 10 RPM in 10,000 RPM (±0.1%). Checks Heat, Anti-Ice and Fire Detection Systems.

BH4101
TEMPERATURE SPREAD TESTER
Determines spread temperature in engines and verifies accuracy of cock-pit indicators.



BH170A
AUTOTAK®
Indicates % RPM to 0.1% for fine adjustment of engine trim.



ENGINE TRIM CHECKER H208-2

We are now introducing this Engine Trim Checker which combines the features of the Auto-Tak and Temperature Spread Tester... with the added feature of reading PT7 pressure. All presentations are digital (automatically null balanced) to ±0.1% indicator accuracy. A universal tester suitable for all jet engine trim operations... and all in a case smaller than ½-cubic-foot!

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2. The owner is American Aviation Publications, Inc., 1001 Vermont Ave., N.W., Washington, D.C.; Stockholders—more than 1%, Wayne W. Parrish, Washington, D.C.; Leonard A. Eiserer, Washington, D.C.; Eric Bramley, Washington, D.C.; Robert R. Parrish, Chicago, Ill.; E. J. Stackpole, Harrisburg, Pa.; Fred S. Hunter, Washington, D.C.; A. H. Stackpole, Harrisburg, Pa.

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5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: 13,423.

LEONARD A. EISERER,
(Signature of business manager)

Sworn to and subscribed before me this 25th day of September, 1961.

RETTA B. LUDDEKE,
Notary Public.

(My commission expires Nov. 14, 1962)

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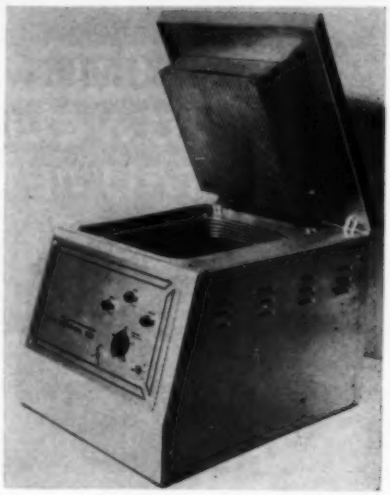

Currier vapor cleaner.

one-step batch cleaning of transistors, the unit has been found effective for cleaning a variety of electronic components, instruments, machined parts and lenses.

Vatronic cleaning refers to vapor cleaning in pure solvent vapors with a simultaneous flushing with pure solvent condensate.

BOOKS

By the Seat of My Pants; Dean C. Smith; 245 pp.; Little-Brown & Co.; $4.50. Dean Smith has been prominent in the aviation industry for a long time, but only the old-timers know what a fabulous history he had as one of the nation's early pilots. This is his story from 1917 when he faked his way into his first flight training at Kelly Field—under-age and with orders he made out himself—through 1930 at the end of the Byrd antarctic expedition on which Dean was one of the four pilots.

Any reader will wonder why Dean Smith ever remained alive. Most of his early colleagues failed to survive the early days, especially the hazardous seven years of the Air Mail Service when it was operated by the P. O. Department before being contracted privately in 1927. (In that period 43 pilots were killed and 23 seriously injured. There were only 43 pilots in the service when it ended in 1927).

Dean writes in an unassuming style, almost self-deprecating. This is a "must" book not only for those who were in the business in the early days but for those who ought to know how flying got underway and led to a vast industry. Lots of familiar names appear in the text—Earl Hoag, H. H. "Hap" Arnold, Jim Doolittle, Tooey Spaatz, Jack Allard, Mike Murphy, D. B. Colyer, Warren "Bill" Williams, Luke Harris, Jack Knight, Harold Harris, E. Ham Lee, Bernt Balchen, Harold June, just to name a few.

There are some interesting sidelights on Richard E. Byrd, to say nothing of some between-the-lines conclusions. Dean C. Smith not only lived among the early greats—but is one himself. An excellent book throughout. *WWP.*

Flying Mary O'Connor; Mary O'Connor; 138 pp.; Rand McNally & Co.; $2.50. Mary O'Connor is almost a legend in the

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airline business. She wasn't the first stewardess hired by United Air Lines, but she certainly became the most famous. Among her many distinctions, she had United's executive Convair named for her. Still active with United, she is in the Chicago offices.

In this unassuming but interesting autobiography, names of United personalities are mentioned—Steve Stimpson who conceived the idea of stewardesses in the first place; Ellen Church, the first airline stewardess; Ed Lott; Eddie Stewart and Charlie Peoples, early United pilots; D. F. Magarrell, and, of course, W. A. Patterson, president.

Miss O'Connor began with United in 1933. In reading her story one wishes she had included more names and incidents from her multitude of experiences, but even this small book is most welcome. *WWP.*

Glory Gamblers; Lesley Forden; 158 pp. (paper back); Ballantine Books; 35¢. Here is truly a fascinating book, the true story of the 1927 Dole Air Race from the mainland to Hawaii. Lesley Forden has done an excellent research job in bringing within two covers the complete and fantastic report on one of the great (and tragic) air events of American history. Arthur C. Goebel, who took the gamble and won, is still living in Los Angeles.

Also around in California are a few others who played a part one way or another—William V. Davis, Jr., Martin Jensen, Ernest Smith, Livingston Irving, Eyer L. Sloniger, Clarence Young, Ben Wyatt, Rev. Lester Maitland and Vance Breese. Benny Griffin is in the east, Ken Boedecker is active in the industry, and Billy Parker is in Bartlesville, Okla., and Fred G. McElwain is superintendent of Oakland International airport.

Five planes were wrecked, three lost at sea, and ten lives lost, in the hectic scramble to win the $25,000 prize money in the fall of 1927, some months after Charles Lindbergh made his solo hop to Paris and stirred the world's imagination. Many other names aside from the above, recognized by those in the business, including A. M. Rochlen, now a commissioner of Los Angeles Airport, appear in the text. Anyone who has the slightest interest in aviation prior to World War II ought to have this book. *WWP.*

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At Long Last . . . Airport No. 580, Goal of a 15-year-old hobby

By Wayne W. Parrish

(This article is also appearing in the November issue of Air Travel Magazine)

At 4:55 p.m. MST on Sunday, September 17, I landed in a Frontier Airlines DC-3 at Sterling, Colo., about 125 miles northeast of Denver.

It was airport #580 or #634, take your choice. The main significance was that I had landed on or taken off from every airport served by a federally-certificated scheduled carrier in the continental United States, and had done so only on regularly scheduled flights.

As of Sept. 17 there were 580 airports being served by scheduled carriers. But in order to reach that goal I had actually gone to 634—some 54 having suspended airline service for one reason or another (chiefly lack of traffic) since my hobby began. (There were probably 25 or 30 more airports which had had service which was suspended before I ever got a chance to get there.)

I'm sure I'm the only person to have had this particular hobby and to have completed it as of a certain date. If I hadn't started it some 15 years ago, I never could have finished the job. The time and cost kept increasing so rapidly in the past few years that there were times when I almost despaired and gave up. It is theoretically possible, but practically impossible, for anyone to start such a hobby today. Cost alone would be prohibitive because of so much hop-skip service.

It hasn't been easy. So many small stops have weather limitations of one sort or another which prohibit regularity of service. If it isn't morning or evening fog it is high cross winds or a bad storm or just plain low ceiling. And many small stops are passed over by local carriers, especially on weekends, when there is no mail or passenger traffic. Then there is the mechanical or cancelled flight which wrecks an itinerary.

When I first started the hobby, there were only a few hundred airports being served. Then the CAB began authorizing whole networks of local services and for awhile I was nipping off one new airport for every three or four going into service. I was taking one step forward and two backwards. In time I began hitting as many new airports per year as the CAB was authorizing. In the past few years I managed to keep ahead of CAB and during this past summer I decided I would keep flying until I finished the job. I missed my own deadline by several weeks.

For example, on one swing in August, I flew 4700 miles just to hit seven airports. I missed two, one due to resurfacing of runways (about which I didn't know until too late) and one because the carrier overflew on a Sunday evening flight—no business.

Just take Sterling, Colo., the final one. It was the fourth effort to hit this town. A year or two ago I overflew because of weather but hit all the other stops on the route. Second time, Frontier had a mechanical with a six or seven hour delay, so I postponed the effort. Third time, the runways were being resurfaced. Fourth time—success.

And it was a fine ending. I had advised Frontier several weeks in advance that Sterling would be the last, so D. Walter Swan, assistant to L. B. Maytag, Jr., Frontier's president, got things in motion. Swan really organized.

In best of company

On that Flight #54, which left Denver at 4:15 p.m. on Sept. 17, there were Mr. and Mrs. Maytag (she is the daughter of well-known aviation pioneer Major C. C. Moseley, who owned and operated Grand Central Air Terminal in Glendale, Calif., and still owns the industrial and shopping development that took over the airport); Mr. and Mrs. Swan, and Edward H. Gerhardt, manager of publicity for Frontier.

The crew of #54 (N61442, named *Sunliner Phoenix*), was Capt. James R. Langhofer, First Officer Hal J. Choate, and Stewardess Rose Palmieri. It was a fine warm, clear western day as the DC-3 flew over that prosperous Colorado farming country and landed in the late afternoon sun at Sterling, a community of about 15,000 persons.

On hand was a delegation of civic leaders, including Mayor James Walker who said it was only fitting that Sterling, Colo., should provide a sterling welcome. Others were Kenneth Bellrose, president of the Chamber of Commerce; Graydon Dowis, chairman of the Chambers' aviation committee; George Moore, commissioner of Logan County; Arlie Rudel, manager of the Chamber of Commerce; representatives of the Sterling Journal-Advocate and of KGEK and KOLR; Robert Cady, Frontier's station manager, and, certainly not the least, were two most attractive gals, Logan County Fair Queen Sheila Hitch, and Merchant's Fair Queen Kay Weakley.

After ceremonies at the airport (Frontier had a slight operational delay at Sterling that day), which included my being presented a fine Stetson hat and a model of a Frontier DC-3 mounted on a silver globe, everybody foregathered at the Sterling Country Club for a fine civic banquet with wonderful food and a few informal speeches.

At 8:30 p.m. the Maytags, Swans, Ed Gerhardt and myself, boarded a returning Frontier flight for Denver.

I'm going to miss this hobby, although I do intend to continue hitting any new airports added to the basic networks. For one thing, I collected a fair amount of

Welcome WAYNE PARRISH
COMPLETES 15 YEAR HOBBY VISITING ALL 634
AIRPORTS SERVED BY COMMERCIAL AIRLINES IN CONTI-
NENTAL U.S.A. --- STERLING, COLORADO. SEPT. 17, 1961.

RUNNING FOR OFFICE or just selling snake oil at the county fair? No, it's just WWP at the end of the goal at Sterling, complete with new Stetson hat and a model being presented by (right) L. B. Maytag, Jr., president of Frontier Airlines. At left is Mayor James Walker of Sterling, Col.

loot through the years, everything from maple syrup to pancake flour. An awful lot of good folk came to airports to say hello as I was passing through. I was photographed hundreds of times. I've been made honorary citizen of quite a few towns, honorary member of chambers of commerce, and otherwise honored with scrolls, certificates and the like.

It is possible that my eyes have seen more actual land terrain of the United States than any other person. The airline network touches every far corner of the country and the bulk of my hobby flying was in low-flying DC-3s. I never got tired of looking out over the countryside on new trips. There is no way of calculating the extra hours and miles involved in the hobby—in contrast to my regular business flights—but it is a good estimate that several hundred thousand *extra* miles were flown. And no, I didn't get free passage, either.

When I completed the hobby on Sept. 17, my total logged air mileage, using CAB mileage figures exclusively, and not counting an unknown amount of private and military flying, had passed the 1,300,000 mark. My total for 1961 had passed 65,000 miles. No, I'm not a pilot, but I'm the best passenger any pilot ever had with him. My admiration for airline pilots is high, and for those DC-3 pilots who plod along the local airways today my admiration is combined with respect—they earn their money.

Some of the wind-up trips in July and August were especially interesting. On one weekend I flew up through Michigan to hit Port Huron, Alpena, Pontiac, Cadillac/Reed City, and Manistee/Ludington, all on North Central, and Findlay, Ohio, on Lake Central.

To heaven and back

That north Michigan country is beautiful, especially up around Traverse City, where Warren Rowe, NOR's regional sales manager, took good care of me, and at Pellston, where I changed planes and had some time with Dick Johnson, station manager, an eight-year veteran with NOR. If you don't think Johnson likes that north country, just hark to what he says: "Northern Michigan is the staircase to heaven and Pellston is the last step."

I almost missed Marshfield, Wis., because it was Sunday and there was only a freight package to drop off, but thanks to Capt. R. J. Thornton and Stewardess M. Engelbart, a negotiated agreement was reached to make the stop and I hope North Central will forgive us all even though no passengers got on or off.

It took two flights on Central to wind up this carrier. There was that long morning haul from Kansas City to Denver to hit Hays and Goodland, Kansas, two new stops. It was my second flight with Capt. W. B. Brown. And at Hays I was made an honorary citizen and given a very nice scroll. On another swing I managed to hit Fort Leonard Wood, Mo., overnighted at Tulsa, and hit Parsons/Coffeyville/Independence next day en route to Kansas City. Thanks to Capt. Bill Medcap, Stewardess Jo Kelsey, Don Enos, ass't station manager at Tulsa, and Dick Foulk, station manager at St. Louis, for various bits of courtesy and hospitality.

And by the way, on Central from Kansas City to Denver was one of the cutest and most personable stewardesses it has been my aged pleasure to meet. She's Miss Johnnie Lilja, of Tampa, half Swedish, only 18 years old, and had been flying for just two weeks. Wish I were a lot younger! She's a natural.

At the time it happened, I was pretty

THERE WERE COMPENSATIONS such as this for wearing out DC-3 seats trying to hit all those airports. On left is Kay Weakley, Merchants' Fair Queen, and on right is Sheila Hitch, Logan County Fair Queen, both of Sterling. The guy with the smug expression in the center is re-living his youth, or at least thinking he is.

burned up at a couple of carriers, but all is forgiven. For example, I sat four hours on a DC-3 from Chicago to Kansas City on a Sunday evening in order to hit Kirksville, Mo., and the plane passed right over—no traffic. I just about gave up the hobby that night. So I had to go to Kansas City a few weeks later and this time I bought a round-trip ticket to Kirksville so Ozark had to stop—each way! Word of my flying over had gotten around by this time, so I was met in style in Kirksville by Robert Goben, the alert station manager there, and given a complete tour of the town and a fine steak dinner during the three-hour wait between flights. I flew northbound with popular Capt. Orlando Colosso, quite a guy.

Also at the time it happened, I was burned up at Lake Central. I was booked out of Washington at noon for Morgantown, W.Va., and beyond on an involved itinerary, but the flight was cancelled by the time I reached the airport. So a week or so later I just took the afternoon off, flew to Morgantown and on to Wheeling, read a book in the Wheeling terminal for three hours, and caught a LCA Convair for the return trip. Oddly enough, although Morgantown is only an hour and twelve minutes from Washington, I had never been able to work it in on an itinerary when Capital was serving the stop.

Third from the last stop on my list was Columbus, Ind., and in order to hit it I got up early in Kansas City, flew to Chicago to take a Delta flight to Cincinnati to board Lake Central for Columbus and on back to Chicago to board a United flight to Washington. That was a day of flying! But Cliff Fox and John

ON ONE of numerous swings on the Southern system to hit 52 stops, WWP is welcomed at New Orleans by Frank Hulse, center, Southern's president, and O. L. Sands, airport director.

Magee, resident and district manager respectively of Lake Central, met me for coffee in the fine new Skychef dining room at Cincinnati and gave me a good sendoff.

Morgan City, La., on Trans-Texas, was one of the last ten stops. A big delegation of civic folk waited at the airport to meet me and Ralph Murphy, sales rep based in New Orleans, accompanied me back to New Orleans. I had a fine lunch with him next day in the old French quarter, along with Don Phillips, ex-Capital and now United's manager for Louisiana.

It was Southern Airways that took me the farthest in 1961. Took three swings, two of them long ones, to wind up all the remaining stops. On the two long ones, Archie Yawn, director of adv. and sales promotion for Southern, accompanied me and believe me, he's as much of a bear for punishment as I am. I enjoyed his company immensely, and tasted some very fine southern food. I consider Archie to be one of the best and most alert young executives in the airline business. Don't under-rate that guy.

Final swing down south

On the most recent big swing on Southern, I had to fly to Tri-Cities on Piedmont and overnight there in order to hit Morristown, Tenn., early next morning. Archie was on hand. And let me recommend the Downtowner Hotel in Johnson City, Tenn., as excellent. Later that day came Paris and Union City in western Tennessee, and an overnight at the fine Howard Johnson Motel in Memphis. (Thanks to R. E. "Red" Kale, the local manager for Southern, for transportation and hospitality.) Then came Corinth, Miss., next day en route to Atlanta, from which point I flew to Asheville to talk to the annual Piedmont sales meeting.

Southern's last stop for my hobby was a place with a jawbreaking name, Pascagoula, Miss., down on the Gulf. I had to get up at the Hilton Inn across from New Orleans' airport (and one of the best motels I've stayed in), take a United Viscount to Mobile, have breakfast and read for several hours, and pick up Southern's local back to New Orleans.

I've brushed away more flies, tasted more poor coffee in airport snack bars and cafes, sat on hard seats and read more newspapers, magazines and books in airports than any guy alive.

But it's been a lot of fun, I've met an awful lot of very fine people, and I have a pretty high respect for all airline operations. By and large the system works pretty well. I'll testify on its behalf.

If you're curious, North Central has the largest number of stops among the locals—72. Southern is next with 52. I completed all of the trunk stops some time back, except for Fort Lauderdale, Fla., relatively new, and went in there on Mackey Airlines in June.

Finest single flight segment I've ever flown on: the spur line on Frontier from Grand Junction to Moab, Utah. The scenery is beyond description. The finest single route, before the DC-3s were eliminated and F-27s put into service, was Bonanza's Salt Lake City-Phoenix route. But there are plenty of other highly interesting segments around the country. Finest airplane: the good old DC-3.

Most number of stops in one day has never exceeded 16, but I've made at least three or four trips with that many stops in a single day, all on DC-3s.

My next goal: to start flying nonstop to everywhere. ■

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For further information on Avco's Air Traffic Control Central (AN/GSN-11) write: Director of Marketing, Electronics and Ordnance Division, Avco Corporation, Cincinnati 41, Ohio.

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Many marketing strategists are now getting a hefty assist from local airline service. Reaching a population of over 115,000,000 in 536 cities, local carriers tap more than 90% of the effective buying power in the U. S.

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Most local carriers schedule flights so frequently, convenient connections can easily be made among the major markets in their territories. Just recently, **Central Airlines** stepped up service to such major trading areas as Kansas City, Wichita, Salina and Topeka. **Pacific Air Lines** now provides over 100 flights daily between 31 cities in California, Oregon and Nevada. Current route systems of all domestic local airlines are available from the Association of Local Transport Airlines, Wyatt Bldg.,Washington, D. C.

NEW RADAR-CONVAIRS recently acquired by Central Airlines. 30% of all local plane miles are now flown by turbine or other newer-type equipment.

OSTRICH PLUMES and sequins for the stewardess are part of the Gay Nineties decor on Mohawk Airlines' popular "Gaslight Flights."

Extra services give local flying added economy and comfort

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Allegheny Airlines, for example, lets passengers stamp their own boarding tickets on its no-reservation commuter flights—and slashes fares by as much as 40%. **Piedmont Airlines** lops nearly 75% off the return fare on some weekend flights.

On the lighter side, **Mohawk Airlines** offers passengers free cigars and an authentic Gay Nineties decor on its "Gaslight Flights" to the beautiful New York North Country. **Aloha Airlines** even puts on a floor show en route — as ukelele-playing, native-born stewardesses entertain passengers with singing and hula dancing.

Local carrier sets up vital air link with Glen Canyon Dam

Indicative of how local carriers expand to meet business needs in their areas is the **Bonanza** air service to the site of Glen Canyon Dam — one of the world's biggest building projects at Page, Arizona.

Daily **Bonanza Air Lines** jet prop flights connect Page with Phoenix and Salt Lake City. Personnel of the major contractors on the dam and government officials are the heaviest users of these flights. In addition, Bonanza flies in a variety of air cargo — ranging from medical supplies to construction gear.

GIANT NEW DAM at Glen Canyon will back the Colorado up for 185 miles. Scenic flights to the dam site at Page, Arizona, can be made on Bonanza Air Lines.

Information on how local airlines contribute to America's business growth . . . prepared by Texaco Inc., Aviation Sales Department, 135 East 42nd Street, New York 17, New York.

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